THE BASIS FOR CONTROL OF TOXIC CHEMICALS

VOLUME 2

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W. E. Porter

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Oak Ridge, Tennessee 37830
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FOREWORD

The Material Safety Data Sheets contained in this volume are the basis for the Toxic Chemical Control Program developed by the Industrial Hygiene Department, Health Division, ORNL. The three volumes are the update and expansion of ORNL/TM-5721 and ORNL/TM-5722 "Material Safety Data Sheets The Basis for Control of Toxic Chemicals", Volume I and Volume II. As such, they are a valuable adjunct to the data cards issued with specific chemicals. The chemicals are identified by name, stores catalog number where appropriate, and sequence numbers from the NIOSH Registry of Toxic Effects of Chemical Substances, 1977 Edition, if available.

The data sheets were developed and compiled to aid in apprising the employees of hazards peculiar to the handling and/or use of specific toxic chemicals. Space limitation necessitate the use of descriptive medical terms and toxicological abbreviations. A glossary and an abbreviation list were developed to define some of those sometimes unfamiliar terms and abbreviations. Questions concerning these data sheets should be referred to the Industrial Hygiene Department.

The three volumes are being printed in a looseleaf form to accommodate additional data sheets and updated sheets without the re-issue of new volumes. The page numbers are keyed to the catalog number in the chemical stores at ORNL.
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<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tbody>
<tr>
<td>Albumin</td>
<td>A water-soluble protein excreted in urine</td>
</tr>
<tr>
<td>Anemia</td>
<td>A condition in which the blood is deficient in hemoglobin and/or numbers of red cells compared with normal blood</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>Loss of feeling or sensation, especially the loss of tactile sensibility</td>
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<tr>
<td>Anorexia</td>
<td>Lack or loss of the appetite for food</td>
</tr>
<tr>
<td>Anosmia</td>
<td>Absence of the sense of smell</td>
</tr>
<tr>
<td>Anuria</td>
<td>Total suppression of urinary output by the kidney</td>
</tr>
<tr>
<td>Apathy</td>
<td>Lack of feeling or emotion, indifference</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>Neuralgia or pain in a joint</td>
</tr>
<tr>
<td>Asbestosis</td>
<td>Lung disease caused by prolonged inhaling of asbestos</td>
</tr>
<tr>
<td>Asphyxia</td>
<td>Suffocation</td>
</tr>
<tr>
<td>Bronchiolitis</td>
<td>Capillary bronchitis</td>
</tr>
<tr>
<td>Bronchitis</td>
<td>Inflammation of the bronchial tubes</td>
</tr>
<tr>
<td>Bronchopneumonia</td>
<td>Inflammation of the lungs following infection of the upper respiratory tract, infectious fevers, or debilitating diseases</td>
</tr>
<tr>
<td>Bronchospasms</td>
<td>Bronchial spasm</td>
</tr>
<tr>
<td>Carcinoma</td>
<td>A malignant new growth made up of epithelial cells, which give rise to metastases</td>
</tr>
<tr>
<td>Cataract</td>
<td>An opacity of the crystalline eye lens or its capsule</td>
</tr>
<tr>
<td>Cirrhosis</td>
<td>A disease of the liver marked by the progressive destruction of liver cells</td>
</tr>
<tr>
<td>Conjunctivitis</td>
<td>Inflammation of the conjunctiva, the delicate membrane that lines the eyelids and covers the eyeballs</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Convulsion</td>
<td>A violent contraction of the voluntary muscles</td>
</tr>
<tr>
<td>Cornea</td>
<td>Transparent structure of the external layer of the eyeball</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>Blueness of the skin caused by insufficient oxygenation of the blood</td>
</tr>
<tr>
<td>Delirium</td>
<td>A mental disturbance marked by illusion, hallucinations, physical restlessness, and incoherence</td>
</tr>
<tr>
<td>Dermatitis</td>
<td>Inflammation of the skin</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>Difficult or labored breathing</td>
</tr>
<tr>
<td>Emphysema</td>
<td>A swelling or inflation due to presence of air in the interstices of the connective tissues of the lungs</td>
</tr>
<tr>
<td>Epigastric</td>
<td>Pertaining to the belly or (epigastrium)</td>
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<tr>
<td>Erosion</td>
<td>An eating or gnawing away</td>
</tr>
<tr>
<td>Euphoria</td>
<td>Exaggerated sense of well-being</td>
</tr>
<tr>
<td>Gangrene</td>
<td>Anemic necrosis of tissue</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>Inflammation of the stomach and intestines</td>
</tr>
<tr>
<td>Goiters</td>
<td>Enlargement of the thyroid gland</td>
</tr>
<tr>
<td>Hallucinations</td>
<td>A sense perception not founded upon objective reality</td>
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<tr>
<td>Hematemesis</td>
<td>Vomiting of blood</td>
</tr>
<tr>
<td>Hematuria</td>
<td>Discharge of blood in the urine</td>
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<tr>
<td>Hemoglobinuria</td>
<td>Presence of hemoglobin in the urine</td>
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<tr>
<td>Hemolytic Anemia</td>
<td>Anemia due to active destruction of red cells</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>Inflammation of the liver</td>
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<tr>
<td>Hyperactivity</td>
<td>Overactivity</td>
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</tbody>
</table>
Hyperemia: Excess of blood in any part of the body
Hyperpnea: Abnormal exaggeration of the respiratory movements
Hypotension: Abnormally low blood pressure
Hypothermia: Abnormally low temperature
Inebriation: The condition of being drunk
Ingestion: The act of taking food, medicines, etc. into the body by mouth
Insomnia: Inability to sleep
Intoxication: The condition produced by excessive use of alcohol; also, the state of being poisoned
Lacrimation: The secretion and discharge of tears
Layngitis: Sore throat, hoarseness, and cough due to inflammation of the larynx
Lassitude: Weakness, exhaustion
Lethargy: A condition of drowsiness of mental origin
Leukopenia: Reduction of white cells in the blood
Malaise: Uneasiness, discomfort, and distress
Malignant tumors: Tumors that tend to become progressively worse and result in death
Mottling: A condition of a tissue spotted with patches of color
Myalgia: Pain in a muscle or muscles
Narcosis: A state of profound unconsciousness produced by a drug
Narcotic: Having the effect of producing sleep or stupor and at the same time relieving pain (adj.)
Nausea  
Tending to vomit, feeling of sickness at the stomach

Necrosis  
Death of a circumscribed portion of tissue

Nephritis  
Inflammation of the kidney (hemorrhagic)

Neuritis  
Inflammation of a nerve

Neurotoxic  
Poisonous or destructive to nerve tissue

Oliguria  
Reduced daily output of urine

Opacity  
The condition of being opaque

Opaque  
Impervious to light rays

Pallor  
Paleness

Palpitation  
Unduly rapid beating of the heart

Papilledema  
Edema of the optic papilla

Paralysis  
Loss or impairment due to lesion of muscular mechanism

Petechia  
A small area of discoloration formed by the effusion of blood

Pharyngitis  
Inflammation of the pharynx

Pneumonitis  
Localized inflammation of the lung

Polyneuritis  
Inflammation of many nerves at once

Prostration  
Extreme exhaustion or powerlessness

Psychic disturbances  
Mental disturbances

Pulmonary edema  
Fluid in the lungs

Pulmonary fibrosis  
Fibrous tissues in the lungs

Pyorrhea  
A discharge of pus, particularly from the gums

Retching  
A strong involuntary effort to vomit

Salivation  
An excessive discharge of saliva
<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
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<tbody>
<tr>
<td>Somnolence</td>
<td>Sleepiness</td>
</tr>
<tr>
<td>Stomatitis</td>
<td>Inflammation of the mouth</td>
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<tr>
<td>Stupor</td>
<td>Partial or nearly complete unconsciousness</td>
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<tr>
<td>Triocyanate Intoxication</td>
<td>Characterized by central nervous system stimulation and depression, and muscular incoordination</td>
</tr>
<tr>
<td>Tinnitus</td>
<td>Ringing in the ears</td>
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<tr>
<td>Ulceration</td>
<td>The formation of an ulcer</td>
</tr>
<tr>
<td>Vertigo</td>
<td>A sensation as if the external world were revolving around the patient or if he were revolving in space; the term is sometimes erroneously used as a synonym for dizziness</td>
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</tbody>
</table>
2. Key to Abbreviations
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KEY TO ABBREVIATIONS

cc    cubic centimeter
CNS  central nervous system effects
gm    gram
H     hour
IRR   irritant effects
kg    kilogram (one thousand grams)
LC50  lethal concentration 50 percent kill
LCLo  lowest published lethal concentration
LD50  lethal dose 50 percent kill
LDLo  lowest published lethal dose
C.M.  cubic meter
mg    milligram (one thousandth of a gram; \(10^{-3}\) gm)
ml    milliliter
ppm   parts per million (v/v)
TCLo  lowest published toxic concentration
TDLo  lowest published toxic dose
TLV   threshold limit value
TWA   time weighted average
W     week
Y     year
3. Material Safety Data Sheets
### Organic Compounds

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<td>Bromoform</td>
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<tr>
<td>Bromomesitylene</td>
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<td>Bromomethyl Acetate</td>
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<td>A-Bromonaphthalene</td>
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<td>B-Bromonaphthalene</td>
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<td>P-Bromophenacyl Bromide</td>
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<td>A-Bromopropionyl Bromide</td>
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<td>N-Butyl Chloroacetate</td>
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<td>β-Butylene Bromide</td>
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<td>Iso-butylene Bromide</td>
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<td>N-Butyl Formate</td>
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<tr>
<td>Tert-Butyl Iodide</td>
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<td>N-Butyronitrile</td>
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<td>Carbon Disulfide</td>
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<td>Carbon Tetrabromide</td>
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<td>Catechol</td>
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<td>Chloranil</td>
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<td>α-chloro-acetophenone</td>
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<td>Chloroacetyl chloride</td>
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<td>P-Chloroaniline</td>
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<td>O-Chlorobenzaldehyde</td>
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<td>P-Chlorobenzaldehyde</td>
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<tr>
<td>P-Chlorobenzonitrile</td>
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<td>O-Chlorobenzoyl Chloride</td>
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<td>P-Chlorobenzoyl Chloride</td>
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<td>O-Chlorobenzyl Chloride</td>
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<td>4 Chlorobromobenzene</td>
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<td>G-Chlorobutyronitrile</td>
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<tr>
<td>Chloroform (trichloromethane)</td>
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<td>2 Chloro-5-Hydroxytoluene</td>
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<td>1 Chloro-1-Nitropropane</td>
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<td>3-Chloro, 1,2 Propanediol</td>
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<td>β-Chloropropionyl Chloride</td>
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<td>M-Chlorotoluene</td>
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<td>Coumarin</td>
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<td>M-Cresol</td>
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<td>Cyclohexylamine</td>
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<td>Decahydronaphthalene</td>
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<td>3,4-diaminoanisole dihydrochloride</td>
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<td>1,4-Diaminobutane Dihydrochloride</td>
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<tr>
<td>Diazoaminobenzene</td>
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</tbody>
</table>
1,2,5,6 Dibenzanthracene
Dibenzothiophene
P-Dibromobenzene
4,6-Dibromo-O-Cresol
4,4-Dibromobiphenyl
2,6-Dibromo-4 Nitrophenol
2,4-Dibromophenol
2,6-Dibromophenol
3,5 Dibromopyridine
2,5-Dibromotoluene
Diisobutyl Amine
N-dibutylamine
Di-Sec Butylamine
Di-N-Butylaniline
Di-N-Butyl Mercury
Dichloroacetyl Chloride
2,4-Dichlorobenzaldehyde
M-dichlorobenzene
0-Dichlorobenzene
P-Dichlorobenzene
2,5-Dichloronitrobenzene
1,2-dichloro-4-nitrobenzene
2,4 Dichlorophenol
2,5-Dichlorophenylhydrazine
Dicyclo-hexylamine
Dicyclopentadiene
Diethylamine
Diethylamine Hydrochloride
Diethylaniline
2 Diethylamino-1,4-Dimethylbenzene
4-Diethylamino-1,3-Dimethyl Benzene
Diethylaniline
Diethyl-M-Toluidine
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<td>Dimethylsulfoxide</td>
<td>240-3505</td>
</tr>
<tr>
<td>Dimethyl-M-Toluidine</td>
<td>240-4304</td>
</tr>
<tr>
<td>Dimethyl-O-Toluidine</td>
<td>240-4404</td>
</tr>
<tr>
<td>Dimethy-P-Toluidine</td>
<td>240-4504</td>
</tr>
<tr>
<td>2,4 Dinitroaniline</td>
<td>240-4804</td>
</tr>
<tr>
<td>2,4-Dinitroanisole</td>
<td>240-5304</td>
</tr>
<tr>
<td>M-Dinitrobenzene</td>
<td>240-5804</td>
</tr>
<tr>
<td>3,5 Dinitrobenzoyl Chloride</td>
<td>240-6304</td>
</tr>
<tr>
<td>2,4-Dinitrobromobenzene</td>
<td>240-6804</td>
</tr>
<tr>
<td>2,4-Dinitrochlorobenzene</td>
<td>240-7004</td>
</tr>
<tr>
<td>4,6-Dinitro-O-Cresol</td>
<td>240-7304</td>
</tr>
<tr>
<td>4,4-Dinitrophenyl</td>
<td>240-7804</td>
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<tr>
<td>4,4-Dinitrodi phenylmethane</td>
<td>240-8304</td>
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<tr>
<td>2,4-Dinitrophenetole</td>
<td>240-9804</td>
</tr>
<tr>
<td>2,4-Dinitrophenol</td>
<td>241-0405</td>
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<tr>
<td>2,4 Dinitrophenyl Hydrazine</td>
<td>241-0605</td>
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<tr>
<td>2,6 Dinitrothymol</td>
<td>241-0905</td>
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</tbody>
</table>
2,4-Dinitrotoluene 241-1405
P-Diiodobenzene 241-2405
P-Dioxane 241-2906
Diphenyl 241-4905
M-Diphenylbenzene 241-6405
O-Diphenylbenzene 241-6505
P-Diphenylbenzene 241-6605
As-Diphcnylhydrazine Hydrochloride 242-0606
1,4-Diphenylsemicarbazide 242-2606
Di-iso-Propanolamine 242-5606
Di-iso-Propylamine 242-6106
Di-N-propyl amine 242-6206
N,N-Di-N-Propylaniline 242-6606
Di-N-propylcarbinol 242-7106
Epichlorohydrin 242-0407
Ethanolamine 244-1707

Ether
Ethyl Ether 246-1908
N-Butyl Ether 246-4308
4,4-Dibromodiphenyl Ether 246-6708
β,β' Dichlorodiethyl Ether 246-6908
S-Dichloromethyl Ether 246-7608
Ethylene Glycol, Monobutyl Ether 247-0909
Ethylene Glycolmonoethyl Ether 247-1209
Ethylene glycol
Monomethyl Ether 247-1509
Phenyl Ether 247-5809
Iso-Propyl Ether 247-6209
Resorcinol Monomethyl Ether 247-6709

Organic
β - Ethoxyethyl Acetate 249-1601
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Code</th>
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<tbody>
<tr>
<td>Ethylamine, Anhydrous</td>
<td>249-6601</td>
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<tr>
<td>Ethylamine, hydrochloride</td>
<td>249-6701</td>
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<tr>
<td>N-Ethylaniline</td>
<td>249-7101</td>
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<tr>
<td>Ethylbenzene</td>
<td>249-8601</td>
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<td>Ethylbenzylaniline</td>
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<tr>
<td>Ethyl Bromide</td>
<td>250-0702</td>
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<tr>
<td>Ethyl Bromoacetate</td>
<td>250-0902</td>
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<tr>
<td>Ethyl-A Bromopropionate</td>
<td>250-2002</td>
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<tr>
<td>Ethyl-B Bromopropionate</td>
<td>250-2102</td>
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<tr>
<td>Ethyl Carbonate</td>
<td>250-2702</td>
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<tr>
<td>Ethyl Chloroacetate</td>
<td>250-3502</td>
</tr>
<tr>
<td>Ethyl Chlorocarbonate</td>
<td>250-3702</td>
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<tr>
<td>Ethylene Bromide</td>
<td>250-6202</td>
</tr>
<tr>
<td>Ethylene Bromohydrin</td>
<td>250-6402</td>
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<tr>
<td>Ethylene Chlorobromide</td>
<td>250-6702</td>
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<tr>
<td>Ethylene Chlorohydrin</td>
<td>250-6902</td>
</tr>
<tr>
<td>Ethylene Diacetate</td>
<td>250-7202</td>
</tr>
<tr>
<td>Ethylene Diamine</td>
<td>250-7402</td>
</tr>
<tr>
<td>Ethylene Chloride (Ethylene dichloride)</td>
<td>250-7702</td>
</tr>
<tr>
<td>Ethylene Glycol</td>
<td>250-8202</td>
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<tr>
<td>Ethylene Glycol Diacetate</td>
<td>250-8402</td>
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<tr>
<td>Ethylidene Bromide</td>
<td>251-3303</td>
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<tr>
<td>Ethylidene Chloride</td>
<td>251-3503</td>
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<td>Ethyl Iodide</td>
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<tr>
<td>Ethyl Orthosilicate</td>
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<tr>
<td>Ethyl Isothiocyanate</td>
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<td>Ethyl M-Toluidine</td>
<td>251-9523</td>
</tr>
<tr>
<td>Ethyl-O-Toluidine</td>
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</tr>
<tr>
<td>Ethyl-P-Toluidine</td>
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<tr>
<td>P-Fluorobromobenzene</td>
<td>257-2405</td>
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<td>M-Fluorochlorobenzene</td>
<td>257-2505</td>
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<tr>
<td>Chemical</td>
<td>CAS Number</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>O-Fluorochlorobenzene</td>
<td>257-2545</td>
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<tr>
<td>M-Fluorotoluene</td>
<td>257-3425</td>
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<tr>
<td>O-Fluorotoluene</td>
<td>257-3455</td>
</tr>
<tr>
<td>P-Fluorotoluene</td>
<td>257-3485</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>257-3965</td>
</tr>
<tr>
<td>Formamide</td>
<td>257-4025</td>
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<tr>
<td>Formanilide</td>
<td>257-4405</td>
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<tr>
<td>Fumaryl Chloride</td>
<td>257-5405</td>
</tr>
<tr>
<td>Furfural</td>
<td>257-5905</td>
</tr>
<tr>
<td>Furoyl Chloride</td>
<td>257-7905</td>
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</tbody>
</table>
PRODUCT DESIGNATION
03-221-1100
A-Bromoethylbenzene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
α Phenylethylbromide

CHEMICAL NAME AND SYNONYMS
(1 Bromoethyl) benzene

FORMULA
CH$_3$CHBrC$_6$H$_5$

SECTION II HAZARDOUS INGREDIENTS
BASIC MATERIAL

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD$_{50}$

PERCUT.

LC$_{50}$

SPECIES

CONC.

None available

SECTION III PHYSICAL DATA
BOILING POINT
201°C

°F.

VAPOR PRESSURE
at 105-107

30 mm Hg.

MELTING POINT
-65°C

°F.

VAPOR DENSITY (Air = 1)

6.4

SPECIFIC GRAVITY
(H$_2$O = 1)

1.35

EVAPORATION RATE


SOLUBILITY IN WATER

Pts/100 pts H$_2$O

Tnssoluble

APPEARANCE AND ODOR

Colorless to pale yellow liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA
FLASH POINT
205°F

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Water, foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS
**PRODUCT DESIGNATION**

α-bromoethylbenzene

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td>No</td>
</tr>
</tbody>
</table>

**PRINCIPLE ROUTES OF ABSORPTION**

<table>
<thead>
<tr>
<th>Skin AND EYE</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation, ingestion, skin</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**RELEVANT SYMPTOMS OF EXPOSURE**

Cyanosis, deep & rapid respiration, irregular pulse, drowsiness, unconsciousness

**EFFECTS OF CHRONIC EXPOSURE**

Lung, liver & kidney damage

**EMERGENCY AND FIRST AID PROCEDURES**

Inhalation - remove from exposure, rest; if swallowed - wash mouth, give emetic, get medical aid; wash eyes & skin.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATABILITY (MATERIALS TO AVOID)**

May react with oxidizing materials

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

**PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE**

Goggles

**MECHANICAL (GENERAL)**

Gloves

**SPECIAL**

Respirator

**SELF CONTAINED BREATHING APPARATUS**

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

221-1100B
**PRODUCT DESIGNATION**

03-221-2100
Bromoform

---

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<tbody>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tribromomethane, Bromoform</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Br₃CH</td>
</tr>
</tbody>
</table>

---

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL PERCUT.</td>
<td>SPECIES</td>
</tr>
<tr>
<td>#1 lowest published lethal dose subcutaneous - rabbit</td>
<td>410 mg/kg.</td>
<td></td>
<td>1820</td>
<td>mouse</td>
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</tbody>
</table>

---

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>149-150°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.3°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (------= 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.9</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt&lt;100 Pt&lt; H₂O</td>
<td></td>
<td>0.1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorless liquid, chloroform odor</td>
</tr>
</tbody>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>UPPPER</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTINGUISHING MEDIA</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
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</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emits toxic fumes when heated</td>
</tr>
</tbody>
</table>

**UCN-1322**
(3 10-74)
PRODUCT DESIGNATION
Bromoform

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 0.5 PPM, 5 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE CARCINOGENIC
IRRITATION No

RELEVANT SYMPTOMS OF EXPOSURE
Narcosis, irritation of respiratory tract, liver damage, tremors, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, give oxygen as needed; ingestion - gastric lavage, and oxygen; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HARMFUL DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)
GLOVES
Rubber

SPECIAL RESPIRATOR
Self contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

221-2100B
PRODUCT DESIGNATION
03-221-2600
Bromohydroquinone

MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Bromohydroquinone

FORMULA
BrC₆H₃(OH)₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA
MW = 189.02

BOILING POINT
sublimes

0°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

113°C.

SPECIFIC GRAVITY (H₂O = 1)

VAPOR DENSITY (Air = 1)

EVAPORATION RATE (__________ = 1)

SOLUBILITY IN WATER

Pts/100 pts H₂O.

VOLATILE % Vol.

% Wt.

Very soluble

APPEARANCE AND ODOR

Leaflets

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

221-2600A
PRODUCT DESIGNATION
Bromohydroquinone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust, ingestion, skin
SKIN AND EYE
IRRITATION
Severe

RELAVANT SYMPTOMS OF EXPOSURE
Nausea, dizziness, increased respiration, headache, cyanosis, delirium and collapse, depigmentation of eyes and skin.

EFFECTS OF CHRONIC EXPOSURE
Eye damage, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting, gastric lavage, medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Safety goggles

MECHANICAL (GENERAL)
GLOVES
Rubber

SPECIAL
RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE.

OTHER PRECAUTIONS

SIGNATURE

DATE

221-2600B
**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
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<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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<tr>
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<tr>
<td>Bromomesitylene</td>
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<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
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<tbody>
<tr>
<td>Bromomesitylene</td>
<td>Br(C₆H₂)(CH₃)₃</td>
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**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
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</thead>
<tbody>
<tr>
<td>None Available</td>
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**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>230°C</th>
<th>VAPOR PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MELTING POINT</td>
<td>-10°C</td>
<td>VAPOR DENSITY (Air = 1)</td>
</tr>
</tbody>
</table>

| SPECIFIC GRAVITY (H₂O = 1) | 1.32 |
| SOLUBILITY IN WATER (Pts/100 pts H₂O) | --- |
| APPEARANCE AND ODOR | Liquid |

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>None available</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHOD USED</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FLAMMABLE (EXPLOSIVE) LIMITS UPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide, dry chemical, alcohol foam.</td>
<td></td>
</tr>
</tbody>
</table>

**UNUSUAL FIRE AND EXPLOSION HAZARDS**
PRODUCT DESIGNATION
Bromomesitylene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC No

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Chemical pneumonia, central nervous system depression, frequent bleeding.

EFFECTS OF CHRONIC EXPOSURE Central nervous system depression, nervousness, tension, anxiety, asthmatic bronchitis.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - oxygen as needed; if swallowed - get medical aid, gastric lavage; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL

RESPIRATOR With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

221-3100B
PRODUCT DESIGNATION
03-221-3600
Bromomethyl Acetate

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

BROMOMETHYL ACETATE

BRCH2OOCCH3

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
OR MAXIMUM OSHA STANDARD
% WT. OR VOL. LD50 LC50

Note: Lowest published lethal dose

Intravenous - mouse 10 mg/kg

SECTION III PHYSICAL DATA

MW = 153.00

BOILING POINT 133°C.

VAPOR PRESSURE

mm Hg.

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1)

EVAPORATION RATE ( = 1)

1.20

SPECIFIC GRAVITY

1.20

SOLUBILITY IN WATER

% VOL.

Volatile

Insoluble

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None Available

METHOD USED

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical, alcohol foam.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

221-3600A
PRODUCT DESIGNATION

Bromomethyl Acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes and upper respiratory system, dizziness and depression, palpitation of heart.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Special

Neoprene

RESPIRATOR

Self contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

221-3600B
PRODUCT DESIGNATION
03-221-4100
A-Bromonaphthalene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
α Naphthyl Bromide

CHEMICAL FAMILY

FORMULA

C_{10}H_{7}Br

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD_{50} ORAL PERCUT.

LC_{50} SPECIES CONC.

None Available

SECTION III PHYSICAL DATA

MW - 207.07

BOILING POINT 281°C.

°F. 600

MELTING POINT

°F.

SPECIFIC GRAVITY (H_{2}O = 1)

1.48

VAPOR PRESSURE

VAPOUR DENSITY (Air = 1)

EVAPORATION RATE

SPECIES

CONC.

VOLATILE

% Vol.

% Wt.

Slightly soluble

APPEARANCE AND ODOR

Colorless oil

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical, or foam.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

221-4100A
PRODUCT DESIGNATION
A-Bromonaphthalene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION Yes

RELEVANT SYMPTOMS OF EXPOSURE
Gastroenteric distress, tremors, convulsions, fever, respiratory failure, headache, nausea, vomiting.

EFFECTS OF CHRONIC EXPOSURE
Clouding of lens.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - gastric lavage, blood transfusion, oxygen.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

GLOVES

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

221-4100B
**PRODUCT DESIGNATION**

03-221-4150
B-Bromonaphthalene

**MATERIAL SAFETY DATA SHEET**

### SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-Naphthyl bromide</td>
<td>C₁₀H₇Br</td>
</tr>
</tbody>
</table>

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>

### SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>282°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>59°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.61</td>
</tr>
<tr>
<td>Solubility in Water (Pts/100 pts H₂O)</td>
<td>Slightly soluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Leaflets</td>
</tr>
</tbody>
</table>

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>None available</td>
</tr>
<tr>
<td>Method Used</td>
<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Carbon dioxide, dry chemical, or foam.</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td></td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td></td>
</tr>
</tbody>
</table>

UCN-11322
(3 10-74) 221-4150A
SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
Gastroenteric distress, tremors, convulsions, fever, respiratory failure, headache, nausea, vomiting.

EFFECTS OF CHRONIC EXPOSURE
Clouding of lens.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - gastric lavage, blood transfusion, oxygen.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

221-4150B
**PRODUCT DESIGNATION**
03-221-5100
P-Bromophenacyl Bromide

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<tbody>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BrC₆H₄COCH₂Br</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Bromophenacyl Bromide</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**SECTION II  HAZARDOUS INGREDIENTS**

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>VAPOR PRESSURE</th>
<th>MIN Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0°F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (A = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>VOLATILE % Vol.</th>
<th>% WT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Appearance and Odor**

- Needle-like crystals

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
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<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>EXTINGUISHING MEDIA</th>
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</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
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<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
P-Bromophenacyl Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION
Eye irritation: corneal haziness and pain; burning of throat & eyes; irritation of skin & eyes.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash from eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

GLOVES

RESPIRATOR

With chemical filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

221-5100B
# Material Safety Data Sheet

**PRODUCT DESIGNATION**

03-221-6100
O-Bromophenol

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
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<tbody>
<tr>
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<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNonyms</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNonyms</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-Bromophenol</td>
<td>Br C₆H₄OH</td>
</tr>
</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PERCUT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPECIES CONC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LD₅₀-1500 mg/kg subcutaneous - rat

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW = 178.02</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>195°C.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>6°C.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>1.55</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER Pts/100 pts H₂O</th>
<th>Soluble</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EVAPORATION RATE</th>
<th>1</th>
<th>= 1</th>
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<table>
<thead>
<tr>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
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</table>

<table>
<thead>
<tr>
<th>FLAMMABLE</th>
<th>UPPER</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EXPLOSIVE</th>
<th>LOWER</th>
</tr>
</thead>
</table>

**EXTINGUISHING MEDIA**

Alcohol foam, carbon dioxide, dry chemical.

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

UCN-11322
(3 10-74)
PRODUCT DESIGNATION
0-bromophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin and mucous membrane irritation, dermatitis, cyanosis.

EFFECTS OF CHRONIC EXPOSURE
Liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; wash skin & eyes; if swallowed - give emetic, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Put sand and soda ash (9:1) mixture on spill and sweep into box for disposal.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Butyl Rubber

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry place.

OTHER PRECAUTIONS

SIGNATURE

DATE

221-6l00B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50

LC50

ORAL PERCUT. SPECIES CONC.

TDLO 7200 mg/kg skin mouse

SECTION III PHYSICAL DATA

MW - 173.02

BOILING POINT 238°F.

VAPOR PRESSURE mm Hg.

MELTING POINT 64°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1) 1.59

EVAPORATION RATE (______ = 1)

SOLUBILITY IN WATER Pts/100 pts H2O 1.4

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR Crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available

METHOD USED

EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical.

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322 (3 10-74)

221-6150A
**PRODUCT DESIGNATION**

P-bromophenol

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**

None available

**PRINCIPLE ROUTES OF ABSORPTION**

Inhalation, ingestion, skin

**SKIN AND EYE IRRITATION**

Severe

**RELEVANT SYMPTOMS OF EXPOSURE**

Eyes, skin and mucous membrane irritation; dermatitis, cyanosis.

**EFFECTS OF CHRONIC EXPOSURE**

Liver damage.

**EMERGENCY AND FIRST AID PROCEDURES**

Inhalation - rest; wash from skin, eyes; if swallowed - give emetic, get medical aid.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

---

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

---

**INCOMPATIBILITY (MATERIALS TO AVOID)**

---

**HAZARDOUS DECOMPOSITION PRODUCTS**

---

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Pour sand to soda ash (9:1) mixture on spill and sweep into disposal box.

**WASTE DISPOSAL METHOD**

---

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS</th>
<th>LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</th>
<th>EYE GOGGLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECHANICAL (GENERAL)</td>
<td>GLOVES</td>
<td>Butyl rubber</td>
<td></td>
</tr>
<tr>
<td>SPECIAL</td>
<td>RESPIRATOR</td>
<td>Self-contained</td>
<td></td>
</tr>
</tbody>
</table>

**OTHER PROTECTIVE EQUIPMENT**

Protective clothing.

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

Store in cool, dry place.

**OTHER PRECAUTIONS**

---

**SIGNATURE**

---

**DATE**

---

221-6150B
**PRODUCT DESIGNATION**

03-221-7100
Bromopicrin

---

**SECTION I  SOURCE AND NOMENCLATURE**

**MANUFACTURER'S NAME**

**EMERGENCY TELEPHONE NO.**

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS**

Bromopicrin

---

**SECTION II  HAZARDOUS INGREDIENTS**

**FORMULA**

Br₃CNO₂

**APPROXIMATE OR MAXIMUM % WT. OR VOL.**

**ESTABLISHED OSHA STANDARD**

**LD₅₀**

**LC₅₀**

None available

---

**SECTION III  PHYSICAL DATA**

**MW**

297.77

**BOILING POINT**

127°C (260°F)

**MELTING POINT**

103°C (217°F)

**SPECIFIC GRAVITY (H₂O = 1)**

2.79

**SOLUBILITY IN WATER**

Insoluble

**APPEARANCE AND ODOR**

Oily colorless liquid

---

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

**FLASH POINT**

None available

**METHOD USED**

**FLAMMABLE (EXPLOSIVE) LIMITS**

**UPPER**

**LOWER**

**EXTINGUISHING MEDIA**

Water, carbon dioxide, dry chemical.

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

May explode on heating.
PRODUCT DESIGNATION

Bromopicrin

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

Carcinogenic No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

Skin and eye

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE

Skin, eye, lung irritant, vomiting, bronchitis and pulmonary edema.

EFFECTS OF CHRONIC EXPOSURE

- -

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

- -

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

- -

INCOMPATIBILITY (MATERIALS TO AVOID)

Oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS

- -

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

- -

WASTE DISPOSAL METHOD

- -

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

- -

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety goggles

MECHANICAL (GENERAL)

Gloves

SPECIAL

Rubber

OTHER PROTECTIVE EQUIPMENT

RESPIRATOR

Self-contained

Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Protect against physical damage, outside storage recommended.

OTHER PRECAUTIONS

- -

SIGNATURE

DATE

221-7100B
### SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-Bromopropionyl Bromide</td>
<td>CH₃CHBrCOBr</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH₃CHBrCOBr</td>
</tr>
</tbody>
</table>

### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ OR MAXIMUM OSHA STANDARD</th>
<th>LC₅₀ OR MAXIMUM OSHA STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPROXIMATE LD₅₀ OR MAXIMUM LC₅₀</th>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>available</td>
</tr>
</tbody>
</table>

### SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>154°C.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (--- = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.06</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not use water or foam, use carbon dioxide or dry chemical.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>When heated to decomposition point gives off toxic bromide fumes.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**PRODUCT DESIGNATION**
Bromopropionyl Bromide

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>None available</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>PRINCIPLE ROUTES OF ABSORPTION</th>
<th>Inhalation, ingestion</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>RELEVANT SYMPTOMS OF EXPOSURE</th>
<th>Irritation of eyes and respiratory system; severe internal damage if swallowed; eye and skin burns.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EFFECTS OF CHRONIC EXPOSURE</th>
<th>Bronchial irritation, erosion of teeth.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>RELEVANT SYMPTOMS OF EXPOSURE</th>
<th>Irritation of eyes and respiratory system; severe internal damage if swallowed; eye and skin burns.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EMERGENCY AND FIRST AID PROCEDURES</th>
<th>Inhalation - rest; if swallowed - drink water, milk of magnesia, get medical aid; wash skin &amp; eyes.</th>
</tr>
</thead>
</table>

**SECTION VI REACTIVITY DATA**

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO INSTABILITY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION</td>
<td></td>
</tr>
<tr>
<td>INCOMPATABILITY (MATERIALS TO AVOID)</td>
<td>Reacts with water to produce H Br</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HAZARDOUS DECOMPOSITION PRODUCTS</th>
<th></th>
</tr>
</thead>
</table>

**SECTION VII SPILL OR LEAK PROCEDURES**

<table>
<thead>
<tr>
<th>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>WASTE DISPOSAL METHOD</th>
<th></th>
</tr>
</thead>
</table>

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS</th>
<th>LOCAL EXHAUST</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</td>
<td>EYE</td>
</tr>
<tr>
<td>Goggles</td>
<td></td>
</tr>
</tbody>
</table>

| MECHANICAL (GENERAL) | |
| GLOVES | |

| SPECIAL | |
| RESPIRATOR | |

| OTHER PROTECTIVE EQUIPMENT | |
| Rubber apron | |

| SELF-CONTAINED | |

**SECTION IX SPECIAL PRECAUTIONS**

<table>
<thead>
<tr>
<th>PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>OTHER PRECAUTIONS</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>221-7600B</td>
<td></td>
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</tbody>
</table>
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

α Bromo-pyridine

FORMULA

BrC 5 H 4 N

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE

OR MAXIMUM

ESTABLISHED

LD50

LC50

% WT. OR VOL.

OSHA

STANDARD

ORAL

PERCUT.

SPECIES

CONC.

#1 lowest published lethal dose

intraperitoneal - mouse 31.3 mg/kg.

SECTION III PHYSICAL DATA

MW - 158.01

BOILING POINT

193°C

°F.

VAPOR PRESSURE

mm Hg.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H 2 O = 1)

1.657

EVAPORATION RATE (_______ = 1)

SOLUBILITY IN WATER

Pts/100 pts H 2 O

VOLATILE

% Vol.

% Wt.

Slightly soluble

APPEARANCE AND ODOR

Liquid with fish-like odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

N/A

METHOD USED

VOLATILE (EXPLOSIVE) LIMITS

FLAMMABLE

LOWER

UPPER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
2-Bromopyridine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic No

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Narcosis, headache, nausea, giddiness, vomiting;
oral - liver & kidney damage.

EFFECTS OF CHRONIC EXPOSURE
Occasional vomiting and diarrhea; weight loss and anemia;
ocular and facial paralysis.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting,
then gastric lavage; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
Use in hood

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL
Rubber

RESPIRATOR
Self-contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

221-9100B
**MATERIAL SAFETY DATA SHEET**

**SECTION I SOURCES AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-Bromotoluene</td>
<td>3-Bromotoluene</td>
</tr>
</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>None</td>
<td>available</td>
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**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW - 171.04</th>
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<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
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</thead>
<tbody>
<tr>
<td>Boiling</td>
<td>183.7</td>
</tr>
<tr>
<td>Melting</td>
<td>-39.8</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.41</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
</tbody>
</table>

| APPEARANCE AND ODOR | Colorless liquid |

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>N/A</td>
</tr>
<tr>
<td>Method Used</td>
<td>Alcohol foam, carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

**UNUSUAL FIRE AND EXPLOSION HAZARDS**
PRODUCT DESIGNATION
M-Bromotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye & respiratory system irritation, severe internal irritation of digestive tract.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL SPECIAL HAZMAT with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

222-1201B
# Material Safety Data Sheet

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CH₃C₆H₄Br</td>
</tr>
</tbody>
</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or VOL.</th>
<th>Established OSHA Standard</th>
<th>LD₉₀ ORAL</th>
<th>LD₉₀ PERCUT.</th>
<th>LC₅₀ SPECIES</th>
<th>LC₅₀ CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>181°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-28°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.42</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>5.9 mm Hg</td>
</tr>
<tr>
<td>Vapour Density (Air = 1)</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate (</td>
<td></td>
</tr>
<tr>
<td>% Vol.</td>
<td></td>
</tr>
<tr>
<td>% WT.</td>
<td></td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

## Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>175°F</td>
</tr>
<tr>
<td>Method Used</td>
<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Alcohol foam, carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flammable (Explosive) Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
</tr>
</tbody>
</table>

## Unusual Fire and Explosion Hazards
PRODUCT DESIGNATION
O-Bromotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye & respiratory system irritation, severe internal irritation of digestive tract

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL
RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

222-1231B
PRODUCT DESIGNATION

03-222-1261
P-Bromotoluene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

P-Tolyl Bromide, P-Bromotoluene

FORMULA

CH₂C₆H₄Br

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW-171.04

BOILING POINT 185°C 0°F.

VAPOR PRESSURE mm Hg.

MELTING POINT 27°C 0°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

1.39

EVAPORATION RATE 5.9

SPECIFIC GRAVITY

H₂O 1

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Liquid or crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 185°F

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

METHOD USED

Alcohol foam, carbon dioxide, dry chemical

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

222-1261A
PRODUCT DESIGNATION

P-Bromotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

Carcinogenic

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

Skin and eye

IRRITATION

Severe

RELEVANT SYMPTOMS OF EXPOSURE

Eye & respiratory system irritation, severe internal irritation of digestive tract.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - give emetic, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE

Goggles

CLOVES

Rubber

Respirator

With proper filter

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

222-1261B
SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

FORMULA

\( \text{CH}_3\text{COOC}_2\text{H}_5 \)

SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) mg/kg ORAL</th>
<th>LC(_{50}) SPECIES CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD(_{50}) oral - human</td>
<td>500 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowest published toxic concentration in air</td>
<td>14000 rat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhalation - human</td>
<td>200 PPM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>126°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-74°C</td>
</tr>
<tr>
<td>Specific Gravity (H(_2)O = 1)</td>
<td>0.88</td>
</tr>
<tr>
<td>Specific Gravity (H(_2)O = 1)</td>
<td>0.88</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>1 Pt3/100 Pt3 H(_2)O</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>72°F</td>
</tr>
<tr>
<td>Method Used</td>
<td>Closed Cup</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Alcohol foam, carbon dioxide, dry chemical</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td>Water may be ineffective.</td>
</tr>
</tbody>
</table>

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
N-Butyl Acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV-150 PPM, 710 mg/C.M.

SKIN AND EYE CARCINOGENIC NO
IRRITATION Moderate

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Eye irritation, salivation, irritation of respiratory passages.

EFFECTS OF CHRONIC EXPOSURE
Fatigue, loss of weight, blood changes.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - give oxygen as needed; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
Can react with oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper, evaporate in hood, burn paper.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles
GLOVES Rubber
RESPIRATOR With proper filter

OTHER PROTECTIVE EQUIPMENT
Rubber protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, well-ventilated place away from source of ignition.

OTHER PRECAUTIONS

SIGNATURE
DATE

222-2701B
MATERIAL SAFETY DATA SHEET

PRODUCT DESIGNATION
03-222-2741
Iso-Butyl Acetate

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER’S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Isobutyl Acetate

FORMULA
CH₃COOCH₂(CH₃)₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD
LD₅₀ mg/kg
LC₅₀

ORAL PERCUT. SPECIES CONC.

15000 rat
4763 rabbit

Note: Lowest published lethal concentration
in air
inhalation - rat 8000 PPM

SECTION III PHYSICAL DATA

MW - 116.16

BOILING POINT 117°F

0 C

VAPOR PRESSURE at 25°C 20 mm Hg.

MELTING POINT -99°C

0 C

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

0.87

EVAPORATION RATE ( ) = 1

SPECIES CONC.

SOLUBILITY IN WATER Pts/100 pts H₂O 0.6

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR
Colorless liquid, fruit-like odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 64°F

METHOD USED CC

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Iso-Butyl Acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV-150 PPM, 700 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION
Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes & respiratory passages, salivation.

EFFECTS OF CHRONIC EXPOSURE
Fatigue, loss of weight, blood changes.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - give oxygen as needed; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
Can react with oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper: evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles
MECHANICAL (GENERAL)
GLOVES
Rubber
SPECIAL
RESPIRATOR With proper filter

OTHER PROTECTIVE EQUIPMENT
Overalls, self-contained respirator.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in standard combustible liquids storage cabinet, in tightly closed container.

OTHER PRECAUTIONS

SIGNATURE

DATE

222-2741B
PRODUCT DESIGNATION
03-222-2781
Sec-Butyl Acetate

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
Sec - Butyl Acetate

FORMULA
\( \text{CH}_3\text{COOC(CH}_3\text{)}_2\text{C}_2\text{H}_5 \)

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD\(_{50}\) ORAL

PERCUT.

SPECIES

CONC.

None available

SECTION III PHYSICAL DATA

ROILING POINT

\( 113^\circ \text{C} \)

MELTING POINT

SPECIFIC GRAVITY (H\(_2\text{O} = 1\) )

0.87

SOLUBILITY IN WATER

3 Pts/100 pts H\(_2\text{O}\)

APPEARANCE AND ODOR

Colorless liquid, mild odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

88°F

METHOD USED

O.C.

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

222-2781A
PRODUCT DESIGNATION
Sec Butyl Acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV-200 PPM, 950 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Eye irritation, salivation, irritation of respiratory passages.

EFFECTS OF CHRONIC EXPOSURE

Fatigue, loss of weight, blood changes.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid;
inhaled - oxygen as needed; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

Can react with oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

222-2781B
**SECTION I SOURCE AND NOMENCLATURE**

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

2-aminobutane

FORMULA

\((C_2H_5)CH_3CHNH_2\)

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL PERCUT. SPECIES CONC.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>dog</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rabbit</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION III PHYSICAL DATA**

MW-73.14

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>66°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-104°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (H₂O = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.72</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER 100 Pts/100 pts H₂O</th>
<th>VOLATILE % Vol.</th>
<th>% WT.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

APPEARANCE AND ODOR

Colorless liquid ammonia-like odor.

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>°F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>150°F</td>
<td></td>
</tr>
</tbody>
</table>

METHOD USED

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles & self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Sec - Butylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE
Headache; nose, throat & eye irritations, skin & eye burns, restlessness, increased pulse & respiratory rates, convulsions.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - drink water, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL RESPIRATOR Self contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

222-3701B
### SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

1-Phenylbutane

### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50 ORAL</th>
<th>LC50 PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest published lethal dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral - rat</td>
<td>5000 mg/kg.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

### SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>124.31</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>182°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-82°C</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1)</td>
<td>0.86</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>160°F</td>
</tr>
<tr>
<td>Method Used</td>
<td>QC</td>
</tr>
</tbody>
</table>

### EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

### SPECIAL FIRE FIGHTING PROCEDURES

### UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-75)
PRODUCT DESIGNATION
N-Butyl Benzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation (mainly) ingestion

SKIN AND EYE IRRITATION
Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Depression of central nervous system, eye and respiratory system irritation.

EFFECTS OF CHRONIC EXPOSURE
Possible liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles

MECHANICAL (GENERAL)
GLOVES Rubber

SPECIAL RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

222-4701B
MATERIAL SAFETY DATA SHEET

SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER’S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

2 Phenylbutane

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD_{50} mg/kg

LC_{50} % WT.

ORAL PERCUT. SPECIES CONC.

2240 Rat

SECTION III  PHYSICAL DATA

MW-134.25

BOILING POINT

174°C. 174°F.

MELTING POINT

-83°C. -83°F.

SPECIFIC GRAVITY (H_{2}O = 1)

0.86

SOLUBILITY IN WATER

Insoluble

APPEARANCE AND ODOR

Colorless liquid

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

126°F.

METHOD USED

O.C.

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
**PRODUCT DESIGNATION**
Sec - Butyl Benzene

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>None Available</td>
<td>No</td>
</tr>
</tbody>
</table>

**PRINCIPLE ROUTES OF ABSORPTION**
Inhalation (mainly) ingestion

**SITUATED SYMPTOMS OF EXPOSURE**
Depression of central nervous system, eye and respiratory system irritation.

**EFFECTS OF CHRONIC EXPOSURE**
Possible liver and kidney damage.

**EMERGENCY AND FIRST AID PROCEDURES**
Inhalation - rest; if swallowed - give emetic, get medical aid; wash from skin and eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECHANICAL (GENERAL)</td>
<td>Goggles</td>
</tr>
<tr>
<td>SPECIAL</td>
<td>GLOVES Rubber</td>
</tr>
<tr>
<td></td>
<td>RESPIRATOR Self-contained</td>
</tr>
</tbody>
</table>

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

222-4731B
**PRODUCT DESIGNATION**

03-222-4761
Tert-Butyl benzene

**MATERIAL SAFETY DATA SHEET**

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tert-butylbenzene</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>C₅H₅(CH₃)₃</td>
</tr>
</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD₅₀ - oral - rat</td>
<td>500 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F</th>
<th>VAPOR PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>169°C</td>
<td></td>
<td>at 13°C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F</th>
<th>VAPOR DENSITY (Air: 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-58°C</td>
<td></td>
<td>4.62</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O: 1)</th>
<th>EVAPORATION RATE (Air: 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.867</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>160°F</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.C.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foam, carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear goggles and self contained breathing apparatus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
Tert-butylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

CARCINOGENIC No

PRINCIPAL ROUTES OF ABSORPTION
Inhalation (mainly) ingestion

SKIN AND EYE IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Depression of central nervous system, eye & respiratory system irritation.

EFFECTS OF CHRONIC EXPOSURE
Possible liver & kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
Goggles
Gloves
Respirator
Other protective equipment: Rubber
Self contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE __________________________ DATE __________________________

222-4761B
# MATERIAL SAFETY DATA SHEET

## SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C_{4}H_{9}O_{2}CCH_{2}Cl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-Butyl Chloroacetate</td>
<td>N-Butyl Chloroacetate</td>
</tr>
</tbody>
</table>

## SECTION II HAZARDOUS INGREDIENTS

### BASIC MATERIAL

<table>
<thead>
<tr>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50}</th>
<th>LC_{50}</th>
</tr>
</thead>
<tbody>
<tr>
<td>% wt. or vol.</td>
<td></td>
<td>(oral)</td>
<td>(perc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(species)</td>
<td>conc.</td>
</tr>
</tbody>
</table>

None available

## SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td>183°C.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H_{2}O = 1)</th>
<th>EVAPORATION RATE (———— = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.08</td>
<td></td>
</tr>
</tbody>
</table>

| SOLUBILITY IN WATER | VAPOR DENSITY | VOLATILE |
|                   | Pts/100 pts H_{2}O | % Vol.  | % Wt. |
|                   |                   |         |       |

**APPEARANCE AND ODOR**

Colorless liquid

## SECTION IV FIRE AND EXPLOSION HAZARD DATA

### FLASH POINT

None available

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>FLAMMABLE LIMITS (EXPLOSIVE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UPPER</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water may be ineffective.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
**PRODUCT DESIGNATION**
N-Butyl Chloroacetate

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRINCIPLE ROUTES OF ABSORPTION</th>
<th>SKIN AND EYE IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation, ingestion, skin</td>
<td>Moderate to severe</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RELEVANT SYMPTOMS OF EXPOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye and respiratory passage irritation, salivation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EFFECTS OF CHRONIC EXPOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue, loss of weight, blood changes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EMERGENCY AND FIRST AID PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation - give oxygen as needed; if swallowed - give emetic, get medical aid; wash skin &amp; eyes.</td>
</tr>
</tbody>
</table>

**SECTION VI REACTIVITY DATA**

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO INSTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>May react with oxidizing materials.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INCOMPATIBILITY (MATERIALS TO AVOID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May react with oxidizing materials.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HAZARDOUS DECOMPOSITION PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SECTION VII SPILL OR LEAK PROCEDURES**

<table>
<thead>
<tr>
<th>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECHANICAL (GENERAL)</td>
<td>EYE Goggles</td>
</tr>
<tr>
<td></td>
<td>GLOVES Rubber</td>
</tr>
<tr>
<td>SPECIAL</td>
<td>RESPIRATOR With proper filter</td>
</tr>
</tbody>
</table>

**SECTION IX SPECIAL PRECAUTIONS**

<table>
<thead>
<tr>
<th>PRECAUTION TO BE TAKEN IN HANDLING AND STORAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**OTHER PRECAUTIONS**

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

222-8701B
**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2 dibromobutane</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH₂CH₂Br₂</td>
</tr>
</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ORAL PERCU .</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>available</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>166°C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-65°C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellowish liquid</td>
</tr>
</tbody>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) UPPER LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water, foam, carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water may be ineffective.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION

α - butylene bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

PRINCIPAL ROUTES OF ABSORPTION

Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE

Eye irritation, headache, vomiting, drowsiness, narcosis

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, liver & kidney damage

RELEVANT SYMPTOMS OF EXPOSURE

Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear self contained breathing apparatus

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With organic vapor resistant canister

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

222-9211B
PRODUCT DESIGNATION
03-222-9241
ß-Butylene Bromide

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
2,3 dibromobutane

FORMULA
CH₂CHBrCHBrCH₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW - 215.94

BOILING POINT
158 °C

MELTING POINT
-34.5 °C

SPECIFIC GRAVITY (H₂O = 1)
1.78

SOLUBILITY IN WATER
Pts/100 pts H₂O
Insoluble

APPEARANCE AND ODOR
Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
N/A

METHOD USED

EXTINGUISHING MEDIA
Water, foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
310-743

222-9241A
PRODUCT DESIGNATION
β-butylene bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION
Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Eye irritation, headache, vomiting, drowsiness, narcosis, liver & kidney damage.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, liver & kidney damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic; get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Wear self contained breathing apparatus.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE

Goggles

GLOVES

Rubber

SPECIAL

RESPIRATOR

With organic vapor resistant canister

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

222-9241B
PRODUCT DESIGNATION
03-222-9271
Iso-butylene Bromide

MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

1,2 dibromo(1-methylcyclobutyl) (1,2 dibromoiso-butane)

FORMULA

(CH₂)₂CBrCH₂Br

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW - 215.94

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

149°C at 737 ml

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

-70.3°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_________ = 1)

1.76

SOLUBILITY IN WATER

Pts./100 pts. H₂O

VOLATILE

% Vol.

% Wt.

Insoluble

APPEARANCE AND ODOR

Colorless, liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

FLAMMABLE (EXPLOSIVE) LIMITS

N/A

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

Water, foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

222-9271A
PRODUCT DESIGNATION
Iso-butylene bromide

SECTION V HEALTH HAZARD DATA
TOXIC LEVEL
None available
CARCINOGENIC No
PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion
SKIN AND EYE IRRITATION Moderate
RELEVANT SYMPTOMS OF EXPOSURE
Eye irritation, headache, vomiting, drowsiness, narcosis, liver & kidney damage.
EFFECTS OF CHRONIC EXPOSURE
Dermatitis, liver & kidney damage
EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth give emetic, get medical aid; wash from eyes & skin.

SECTION VI REACTIVITY DATA
CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Wear self contained breathing apparatus.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION
VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

GLOVES

RESPIRATOR

With organic vapor resistant canister

SECTION IX SPECIAL PRECAUTIONS
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

222-92/1B
PRODUCT DESIGNATION
03-223-0302
N-Butyl Formate

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Butyl Methanoate

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD
LD50 mg/kg
IC50 CONC.

SECTION III PHYSICAL DATA

Boiling Point °F. VAPOR PRESSURE mm Hg.
106°C 31.6°C 40
MELTING POINT °F. VAPOR DENSITY (Air = 1)
-90°C 3.52
SPECIFIC GRAVITY (H2O = 1) EVAPORATION RATE (%)
0.911 1%
SOLUBILITY IN WATER Pts/100 pts H2O VOLATILE % Vol.
slightly
APPEARANCE AND ODOR colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT °F.
64°F

METHOD USED CC

EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

LC50
2660 rabbit
PRODUCT DESIGNATION
N-Butyl formate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC NO

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritant of mucous membranes & respiratory tract, eye irritation, salivation, vomiting.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic; get medical aid; wash from eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper, evaporate in hood.

WASTE DISPOSAL METHOD
Mix with more flammable solvent and burn.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

Chemical cartridge respirator

OTHER PROTECTIVE EQUIPMENT

Overalls

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep away from source's of ignition.

OTHER PRECAUTIONS

SIGNATURE

DATE

223-0302B
**PRODUCT DESIGNATION**

03-223-2312
Iso-Butyl Iodide

**MATERIAL SAFETY DATA SHEET**

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</td>
<td></td>
</tr>
<tr>
<td>TRADE NAME AND SYNONYMS</td>
<td>CHEMICAL FAMILY</td>
</tr>
<tr>
<td>CHEMICAL NAME AND SYNONYMS</td>
<td>FORMULA</td>
</tr>
<tr>
<td>1 Iodo-2 Methyl Propane</td>
<td>(CH₃)₂CHCH₂I</td>
</tr>
</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None</td>
<td>available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>0°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>121°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>0°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-94°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (--- = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.60</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorless liquid</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EXTINGUISHING MEDIA**

Water, carbon dioxide, dry chemical

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

When heated to decomposition point emits toxic fumes of iodates.

UCN-11322
(3 10-74)

223-2312A
PRODUCT DESIGNATION
Isobutyl Iodide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Skin and EYE

IRRITATION Slight

RELEVANT SYMPTOMS OF EXPOSURE
Nausea, vomiting, diarrhea, dizziness, visual disturbances, irritability, drowsiness, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

223-2312B
## MATERIAL SAFETY DATA SHEET

### SECTION I SOURCE AND NOMENCLATURE

<table>
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<tr>
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<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Iodobutane</td>
<td>CH₃CH₂CH₂CH₂I</td>
</tr>
</tbody>
</table>

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
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<td>CH₃CH₂CH₂CH₂I</td>
</tr>
</tbody>
</table>

### SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling point</td>
<td>131°F</td>
</tr>
<tr>
<td>Melting point</td>
<td>-103°C</td>
</tr>
<tr>
<td>Specific gravity (H₂O = 1)</td>
<td>1.62</td>
</tr>
<tr>
<td>Solubility in water Pts/100 pts H₂O</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and odor</td>
<td>Colorless to light brown liquid</td>
</tr>
</tbody>
</table>

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
<td>Not available</td>
</tr>
</tbody>
</table>

| EXTINGUISHING MEDIA             | WATER, CARBON DIOXIDE, DRY CHEMICAL |

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>When heated to decomposition point emits toxic fumes of iodates.</td>
<td></td>
</tr>
</tbody>
</table>

UCN-11322
(3 10-74)

223-2332A
PRODUCT DESIGNATION
N-butyl iodide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION Slight

RELEVANT SYMPTOMS OF EXPOSURE Nausea, vomiting, diarrhea, dizziness, visual disturbances, irritability, drowsiness, central nervous system depressant.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Safety goggles

MECHANICAL (GENERAL)
Gloves
Rubber

SPECIAL
Respirator
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

223-2332B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
2-Iodobutane

FORMULA
C\textsubscript{2}H\textsubscript{5}CHICH\textsubscript{3}

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD\textsubscript{50}

LC\textsubscript{50}

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW 184.03

BOILING POINT

120°C

VAPOR PRESSURE

mm Hg

MELTING POINT

-104°F

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H\textsubscript{2}O = 1)

1.60

EVAPORATION RATE (H\textsubscript{2}O = 1)

SOLUBILITY IN WATER Pts/100 pts H\textsubscript{2}O

Insoluble

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Colorless to light brown liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

METHOD USED

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition point emits toxic fumes of iodates.
PRODUCT DESIGNATION
Sec-butyl iodide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
Slight

RELEVANT SYMPTOMS OF EXPOSURE
Nausea, vomiting, diarrhea, dizziness, visual disturbances, irritability, drowsiness, central nervous system depressant

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic; get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)
GLOVES
Rubber

SPECIAL
RESPIRATOR
with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

223-2352A
**PRODUCT DESIGNATION**

03-223-2372
Tert-Butyl Iodide

**MATERIAL SAFETY DATA SHEET**

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
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<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>(CH₃)₂CI</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 iodo-2 methylpropane</td>
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**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>MW</th>
<th>184.03</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None available</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°C</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>99°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°C</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-34°C</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE ( ) = 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.57</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorless liquid</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water, carbon dioxide, dry chemical</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>When heated to decomposition point emits toxic fumes of iodates.</td>
<td></td>
</tr>
</tbody>
</table>

**UCN-11322**

(3 10-74) 223-2372A
PRODUCT DESIGNATION
Tert-butyl iodide

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
Not available

Carcinogenic  No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION slight

RELEVANT SYMPTOMS OF EXPOSURE
Nausea, vomiting, diarrhea, dizziness, visual disturbances, irritability, drowsiness, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash from skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIAL TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE          DATE

223-2372B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Propyl Cyanide

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE

ESTABLISHED

LD50 mg/Kg

ORAL PERCUT.

OSHA STANDARD

SPECIES CONC.

Lowest published lethal dose

oral - rat 50 mg/kg.

200 Rabbit

Lowest published lethal concentration in air

inhalation - rat 400 PPM.

SECTION III PHYSICAL DATA

MW - 69.10

BOILING POINT

°F.

118°C.

VAPOR PRESSURE

mm Hg.

at 15°C.

10

MELTING POINT

°F.

-113°C.

VAPOR DENSITY (Air = 1)

1.07

SPECIFIC GRAVITY (H2O = 1)

0.796

EVAPORATION RATE (____ = 1)

SOLUBILITY IN WATER Pts/100 pts H2O VOLATILE % Vol.

Slightly soluble

% Wt.

APPEARANCE AND ODOR

Colorless liquid, sharp suffocating odor.

SECTION IV FIRE-AND EXPLOSION HAZARD DATA

FLASH POINT

79°F.

METHOD USED

O.C.

EXTINGUISHING MEDIA

Dry chemical, alcohol foam or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES

Protective clothing, self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)
PRODUCT DESIGNATION
N-Butyronitrile

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TWA-TLV-8 PPM, 22 mg/C.M. (NIOSH Value)

CARCINOGENIC NO

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION MODERATE

RELEVANT SYMPTOMS OF EXPOSURE Dizziness, rapid respiration, headache, drowsiness, drop in blood pressure and pulse, delayed symptoms.

EFFECTS OF CHRONIC EXPOSURE Eye irritation, loss of appetite, weight loss, mental deterioration.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - inhalation of amyl nitrite, induce vomiting, or gastric lavage, wash skin & eyes; inhalation, rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS
When heated to decomposition emits highly toxic cyanide fumes.

SECTION VII SPILL OR FAKE PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb with paper towels - evaporate in hood.

WASTE DISPOSAL METHOD Add excess alcoholic sodium hydroxide, after one hour, evaporate alcohol, then add calcium hypochlorite.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

GLOVES

Rubber

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT
Protective apron, full protective clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

225-6403B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
Carbon Disulfide

FORMULA
CS₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE ESTABLISHED
OR MAXIMUM OSHA STANDARD
% WT. OR VOL.

LD₅₀ mg/kg  LC₅₀

LD₅₀ - oral - human 14 mg/kg
LC₅₀ - inhalation - human 4000 ppm/30 min.
TC₅₀ - inhalation - human 50 mg/C.M. - 7 years

SECTION III PHYSICAL DATA

Mol. Wt. 76.1

BOILING POINT
46°C. 0°F. VAPOR PRESSURE (28°C) 400 mm Hg.

MELTING POINT
-110.8°C 0°F. VAPOR DENSITY (Air = 1) 2.6

SPECIFIC GRAVITY (H₂O = 1)
1.3 EVAPORATION RATE ( __________ = 1)

SOLUBILITY IN WATER  Pts/100 pts H₂O VOLATILE % Vol. % Wt.
Insoluble

Clear, colorless to faint yellow liquid; strong disagreeable odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
-22°F

METHOD USED
Closed Cup

FLASH POINT FLAMMABLE (EXPLOSIVE) LIMITS

UPPER 44%
LOWER 1.3%

EXTINGUISHING MEDIA
Foam ineffective; use dry chemical, carbon dioxide, or other inert gas.

SPECIAL FIRE FIGHTING PROCEEDURES
Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Gives off flammable vapors at low temperatures over a wide range; forms explosive mixtures in air; flash back.
PRODUCT DESIGNATION
Carbon Disulfide (skin)

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 20 ppm, 60 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation and prolonged skin contact

SKIN AND EYE IRritATION

RELEVANT SYMPTOMS OF EXPOSURE

Restlessness, blurred vision, nausea, vomiting, headache

EFFECTS OF CHRONIC EXPOSURE
Bizarre sensations in extremities, sensory loss, muscular weakness, memory loss, irritability, blurred vision, insomnia, mental depression, partial blindness, parkinsonian tremor, heart, liver, kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
Remove from exposure; apply artificial respiration; give amyl nitrite or sodium nitrite; rest, keep warm; obtain medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY


CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Azides, chlorine, chlorine monoxide, fluorine, nitric oxide, nitrogen dioxide, (permanganates and sulfuric acid), potassium and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD
Provide safe place for burning it. (Do not pour on ground.)

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles, face shield

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAl

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT
Self-contained breathing apparatus.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep away from sources of ignition, good ventilation. Protect against lightening or static electricity.

OTHER PRECAUTIONS

SIGNATURE DATE

227-4004B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL | APPROXIMATE OR MAXIMUM % WT. OR VOL. | ESTABLISHED OSHA STANDARD | LD₅₀ | LC₅₀ |
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ORAL PERCUT. SPECIES CONC.</td>
<td></td>
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</tr>
<tr>
<td>Lowest Published lethal dose oral - rat 1000 mg/kg. LD₅₀ - subcutaneous - mouse 298 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

BOILING POINT

190°C 10°C

MELTING POINT

α-48°C, β90°C

SPECIFIC GRAVITY (H₂O = 1)

3.42

SPECIFIC HEAT (H₂O = 1)

3.78

SOLUBILITY IN WATER

0.024

VAPOR PRESSURE

12 mm Hg

VAPOR DENSITY (Air = 1)

11.4

VAPOR DENSITY (Air = 1)

11.4

SPECIFIC HEAT (H₂O = 1)

3.78

SOLUBILITY IN WATER

0.024

APPEARANCE AND ODOR

Colorless solid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Nonflammable

METHOD USED

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

Self contained respirator if heated in a fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

227-4504A
PRODUCT DESIGNATION
Carbon tetrabromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 0.1 PPM, 1.4 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye and upper respiratory irritation, lung, liver & kidney damage, damage to cornea.

EFFECTS OF CHRONIC EXPOSURE
Liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation & rest, get medical aid; if swallowed - give emetic, get medical aid; wash from eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Collect on paper, evaporate on dish in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Safety goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL RESPIRATOR

SELF CONTAINED

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

227-4504B
# Material Safety Data Sheet

**Product Designation:** Carbon Tetrachloride  
**CAS:** 000056235  
**Manufacturer:** FG-49000

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Address:** (Number, Street, City, State, Zip Code)

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrachloromethane</td>
<td></td>
<td>CC14</td>
</tr>
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</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or VOL.</th>
<th>Established OSHA Standard</th>
<th>LC50 ppm</th>
<th>LC50 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Oral</td>
<td>Percut.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Species</td>
<td>Conc.</td>
</tr>
</tbody>
</table>

- **LDLo** - human - oral 43 mg/kg  
- **LDLo** - oral - woman 180 mg/kg  
- **TCLO** - inhalation - human 1000 ppm

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Physical Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Weight</td>
<td>153.84</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>76.75°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-22.6°C</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.585</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>0.08 Pts/100 Pts H₂O</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid, sweetish odor (ethereal).</td>
</tr>
</tbody>
</table>

## Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Method Used</td>
<td></td>
</tr>
<tr>
<td>Flammable Limits</td>
<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Water</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td>Wear self-contained breathing apparatus.</td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td>Emits toxic fumes.</td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
Carbon Tetrachloride (skin)

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 10 ppm, 25 mg/C.M.

PRINCIPAL ROUTES OF ABSORPTION
Inhalation of vapor, ingestion, sometimes skin absorption

RELEVANT SYMPTOMS OF EXPOSURE
Abdominal pain, nausea, vomiting, dizziness, loss of blood pressure, respiratory slowing, and fall of blood pressure. Delayed symptoms of liver or kidney damage.

EFFECTS OF CHRONIC EXPOSURE
Liver, kidney damage, anemia, loss of appetite and weight, dermatitis, loss of memory, anorexia.

EMERGENCY AND FIRST AID PROCEDURES
Remove from exposure, rest, keep warm; if necessary, give artificial respiration. Do not give stimulants. Obtain medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Allyl alcohol, aluminum, barium, beryllium, disilane, ethylene, fluorine, alkalies, magnesium, IOX, plutonium, tetrasilane, trisilane, uranium.

HAZARDOUS DECOMPOSITION PRODUCTS
wax, zirconium.
Heated - phosgene (COCl₂)

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Polyvinyl gloves

SPECIAL

RESPIRATOR
Organic filter

OTHER PROTECTIVE EQUIPMENT
Self-contained breathing apparatus

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Protect from physical damage. Store in cool, dry, well-ventilated location away from any area where the fire hazard may be acute.

OTHER PRECAUTIONS

SIGNATURE

DATE

227-4604B
MATERIAL SAFETY DATA SHEET

PRODUCT DESIGNATION

03-227-5004
Catechol

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Pyrocatechol

FORMULA

C₆H₄(OH)₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀

LD₅₀ - oral - human 50 mg/kg

3890 Rat

260 Mouse

550 Guinea pig

800 Rabbit

SECTION III PHYSICAL DATA

MW - 110.11

BOILING POINT 246°F

MELTING POINT 105°C

SPECIFIC GRAVITY (H₂O = 1)

VAPOR DENSITY (Air = 1)

EVAPORATION RATE

VOLATILE

SOCOLORLESS CRYSTAL SALT

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 261°F

METHOD USED CC

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES --

UNUSUAL FIRE AND EXPLOSION HAZARDS --

UCN-11322 (3 10-74)

227-5004A
PRODUCT DESIGNATION: Catechol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 5 ppm, 20 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION

Skin, ingestion

SKIN AND EYE IRRITATION Very severe

RELEVANT SYMPTOMS OF EXPOSURE Central nervous system depression, convulsions

EFFECTS OF CHRONIC EXPOSURE

Blood damage, dermatitis

EMERGENCY AND FIRST AID PROCEDURES

Wash eyes and skin; if swallowed - drink water, then 2 tsp. epsom salts in water; get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety glasses

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL

RESPIRATOR With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

227-5004B
SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

2,3,5,6 Tetrachloric P-Benzquinone

FORMULA

OC₆Cl₄O

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE
OR MAXIMUM
% WT. OR VOL.

ESTABLISHED
OSHA
STANDARD

LD₅₀ mg/kg

LC₅₀

LD₅₀ - oral - human 500 mg/kg

SECTION III  PHYSICAL DATA

MW 245.86

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE % Vol.

% Wi.

APPEARANCE AND ODOR

Yellow crystals

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

EXTINGUISHING MEDIA

Dry chemical, carbon dioxide, alcohol foam.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
### Section V: Health Hazard Data

**Product Designation:** Chloranil  
**Toxic Level:** None available  
**Carcinogenicity:** Yes  
**Relevant Symptoms of Exposure:** Irritation to skin, eye and mucous membrane, headache, dizziness.  
**Effects of Chronic Exposure:** May cause cancer of liver or kidneys.  
**Emergency and First Aid Procedures:** Wash skin & eyes; if swallowed - gastric lavage, get medical aid; inhalation - rest.

### Section VI: Reactivity Data

**Conditions Contributing to Instability:**  
**Conditions Contributing to Hazardous Polymerization:**  
**Incompatibility (Materials to Avoid):**  
**Hazardous Decomposition Products:**

### Section VII: Spill or Leak Procedures

**Steps to be Taken in Case Material is Released or Spilled:**

### Section VIII: Special Protection Information

**Ventilation Requirements Local Exhaust:**  
**Mechanical (General):**  
**Special:**  
**Other Protective Equipment:**  
**Protective Equipment (Specify Types):** Eye safety goggles, gloves, respirator with mechanical filter.

### Section IX: Special Precautions

**Precautions to be Taken in Handling and Storage:**

**Other Precautions:**

**Signature**  
**Date**

227-7504B
PRODUCT DESIGNATION
03-228-0105
Chloroacetone

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
1-Chloro-2-propanone

FORMULA
CH₃COCH₂Cl

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED OR MAXIMUM OSHA STANDARD

% WT. OR VOL. ORAL PERCUT. SPECIES CONC.

Lowest published lethal concentration in air
Inhalation - human - 600 PPM/10 minutes.

SECTION III PHYSICAL DATA

MW - 95.53

BOILING POINT 121°C. °F. VAPOR PRESSURE mm Hg.

MELTING POINT -44.5 °F. VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1) 1.16 EVAPORATION RATE (1 = 1)

SPECIFIC GRAVITY IN WATER Pts/100 pts H₂O

APPEARANCE AND ODOR
Colorless liquid, pungent odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available

METHOD USED

EXTINGUISHING MEDIA
Alcohol foam
Water may be ineffective.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
Emits phosgene on heating to decomposition point.

UCN-11322 (3 10-74) 228-0105A
PRODUCT DESIGNATION
Chloroaceto ne

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Irritation of respiratory system and eyes; ingestion - severe
internal irritation.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest; if swallowed - give emetic, get medical
aid; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDous DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles
Gloves
Rubber
Respirator
Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

228-0105B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Chloromethyl Cyanide

FORMULA
C\(_2\)H\(_2\)CN

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) mg/kg</th>
<th>LC(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>LCLO inhalation - rat</td>
<td>250 ppm/4 hrs.</td>
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</tr>
<tr>
<td>LDLO - skin - rabbit</td>
<td>71 mg/kg</td>
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</table>

SECTION III PHYSICAL DATA

MW - 75.50

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>126(^\circ)C.</td>
</tr>
<tr>
<td>Melting Point</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (H(_2)O = 1)</td>
<td>1.19</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Crystals</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>None available</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Alcohol foam, dry chemical, carbon dioxide, water may be ineffective.</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td>Wear self-contained breathing apparatus.</td>
</tr>
</tbody>
</table>

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Chloroacetonitrile

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Mild to moderate

RELEVANT SYMPTOMS OF EXPOSURE
Dizziness, rapid respiration, headache, drowsiness, drop in blood pressure, rapid pulse, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Dizziness, weakness, lung congestion, eye irritation, loss of appetite and weight, mental deterioration.

EMERGENCY AND FIRST AID PROCEDURES
Remove from area, give amyl nitrite inhalation every 5 minutes, artificial respiration with oxygen, wash skin & eyes, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS
Cyanides

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles
MECHANICAL (GENERAL) GLOVES Rubber
SPECIAL RESPIRATOR Self-contained
OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside or detached storage preferred inside storage in standard liquids storage room.

OTHER PRECAUTIONS

SIGNATURE DATE

228-0605B
# Material Safety Data Sheet

## Product Designation

03-228-1100  
α-chloro-acetophenone

## Section I  Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Phenacyl Chloride</td>
</tr>
</tbody>
</table>

## Formula

C\(_1\) Cl CH\(_2\) COC\(_6\)H\(_5\)

## Section II  Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or VOL.</th>
<th>Established OSHA Standard LD(_{50})</th>
<th>LC(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Oral PERCUT. SPECIES CONC.</td>
<td></td>
</tr>
</tbody>
</table>

Lowest published lethal concentration in air  
inhalation - human 8500 mg/C.M. 10 month exposure  
Lowest published toxic concentration in air  
inhalation - human 93 mg/C.M. - 3 month exposure  
TCLO - inhalation - human - 20 mg/C.M. irritant

## Section III  Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>237-247°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>56°C</td>
</tr>
<tr>
<td>Specific Gravity (H(_2)O = 1)</td>
<td>5.2</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Pts/100 pts H(_2)O</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>White crystals - fragrant non-persistent odor</td>
</tr>
</tbody>
</table>

## Section IV  Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>244°F</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Carbon dioxide, dry chemical</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td></td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td>May react with water or steam to produce toxic and corrosive fumes</td>
</tr>
</tbody>
</table>

UCN-11322  
(3 10-74)
PRODUCT DESIGNATION
α-chloro-acetophenone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV-0.05 PPM, 0.3 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye irritation, corneal haziness and pain; burning of throat and eyes; irritation of skin and eyes.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - remove from exposure, rest, treat for pulmonary edema; if swallowed - wash mouth, give emetic, get medical aid; wash mouth, give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towels, evaporate in hood.

WASTE DISPOSAL METHOD
Dissolve in a combustible liquid and burn.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT
Protecting clothing

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles

GLOVES Rubber

RESPIRATOR Self contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

228-1100B
### MATERIAL SAFETY DATA SHEET

**PRODUCT DESIGNATION**

02-228-1605
Chloroacetyl chloride

### SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-chloroacetyl chloride</td>
<td>C1CH₂COCl</td>
</tr>
</tbody>
</table>

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM LD₅₀ LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% WT. OR VOL. STANDARD ORAL PERCUT. SPECIES CONC.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Lowest published lethal dose**
  - Inhalation - rat 1000 PPM

### SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>MW</th>
<th>112.95</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>°F</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>°F</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H₂O = 1)</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H₂O</td>
</tr>
<tr>
<td></td>
<td>% Vol.</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>Water white or slightly yellow liquid</td>
</tr>
</tbody>
</table>

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>N/A</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Do not use water or foam use carbon dioxide or dry chemical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UNUSUAL FIRE AND EXPLOSION HAZARDS</td>
<td>When heated to decomposition point gives off toxic chloride fumes</td>
</tr>
</tbody>
</table>

UCN-11322 (3 10-74) 228-1605A
PRODUCT DESIGNATION
Chloroacetyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
50 PPB

Carcinogenic No

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion

IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes and respiratory system; severe internal damage if swallowed; eye & skin burns.

EFFECTS OF CHRONIC EXPOSURE
Bronchial irritation, erosion of teeth.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, get medical aid; if swallowed - drink water, milk of magnesia, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Reacts with water to produce HCl alcohol & dimethyl sulfoxide

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Cover spill with sodium bicarbonate

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
- Mechanical (general)
- Special

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Goggles

GLOVES
Rubber

RESPIRATOR
Self contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

228-1605B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

Fast Yellow GC Base

CHEMICAL NAME AND SYNONYMS

O-Chloroaniline

FORMULA

Cl(C₆H₄)NH₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀ % Vol.

SPECIES CONC.

256 Mouse

222 Cat

SECTION III PHYSICAL DATA

MW - 127.58

BOILING POINT 211°C. 760 mm Hg.

MELTING POINT 0°C.

SPECIFIC GRAVITY (H₂O = 1) 1.21

SPECIES VAPOR DENSITY (Air = 1)

EVAPORATION RATE (—— = 1)

SPECIES % VOL.

30% Insoluble

APPEARANCE AND ODOR

Liquid, sweet odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available

METHOD USED

EXTINGUISHING MEDIA

Water spray, carbon dioxide, alcohol foam.

SPECIAL FIRE FIGHTING PROCEDURES

Self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Vapor may form explosive mixtures in air.
PRODUCT DESIGNATION
O-Chloroaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, skin, ingestion

SKIN AND EYE
Inhitation Low

RELEVANT SYMPTOMS OF EXPOSURE
Headache, nausea, vomiting, jaundice, convulsions

EFFECTS OF CHRONIC EXPOSURE
Severe kidney damage, some liver damage, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES
Remove from exposure; wash skin & eyes; if swallowed - remove by gastric lavage and cathartics; oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Sodium and potassium peroxide, ozone, perchloric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Wear protective clothing during cleanup.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)
Goggles

SPECIAL
Gloves
Rubber
RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in flammable liquids cabinets.

OTHER PRECAUTIONS

SIGNATURE

DATE

228-2635B
PRODUCT DESIGNATION
03-228-2665
P-Chloroaniline

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
P-Chloroaniline

FORMULA
C₆H₅(Cl)NH₂

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTAB SHED LD₅₀ mg/kg LC₅₀
% WT. OR VOL. ESTABLISHED OSHA STANDARD SPECIES CONC.

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest published toxic concentration in air</td>
<td>Crystalline solid, sweet odor.</td>
</tr>
<tr>
<td>44 mg/C.M. inhalation - human</td>
<td></td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA
MW - 127.58°C.

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>231°C. (449°F.)</td>
</tr>
<tr>
<td>Melting Point</td>
<td>77°C. (170°F.)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.43</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Soluble in hot water</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>1.43</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Crystalline solid, sweet odor.</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

APPEARANCE AND ODOR

EXTINGUISHING MEDIA
Water spray, carbon dioxide, alcohol foam.

SPECIAL FIRE FIGHTING PROCEDURES
Self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Vapor may form explosive mixtures in air.
PRODUCT DESIGNATION

P-Chloroaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None Available

Carcinogenic No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, skin, ingestion

SKIN AND EYE IRRITATION Low

RELEVANT SYMPTOMS OF EXPOSURE Cyanosis, headache, blood pressure drop, lethargy, jaundice & anemia, pain in joints, fainting.

EFFECTS OF CHRONIC EXPOSURE Weight loss, anemia, weakness and irritability, possible liver damage, inflammation of kidney, ringing in ears.

EMERGENCY AND FIRST AID PROCEDURES Remove from exposure; wash from skin & eyes; if swallowed - remove by gastric lavage and catharsis; give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Sodium and potassium peroxide, ozone, perchloric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear protective clothing during cleanup.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL

RESPIRATOR Self-contained

OTHER PROTECTIVE EQUIPMENT

Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in flammable liquids cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

228-2665B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

FORMULA

2-chlorobenzaldehyde

Cl C₆H₄CHO

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
OR MAXIMUM OSHA STANDARD

LD₅₀ LC₅₀

BASIC MATERIAL % WT. OR VOL.

ORAL PERCUT. SPECIES CONC.

#1 lowest published lethal dose
intrapertoneal - mouse 10 mg/kg

SECTION III PHYSICAL DATA

MW = 140.57

BOILING POINT

°F. VAPOR PRESSURE mm Hg.

208

MELTING POINT

°F. VAPOR DENSITY (Air = 1)

11°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (________ = 1)

1.29

SOLUBILITY IN WATER Pts/100 pts H₂O VOLATILE % Vol. % Wr.

Very slightly soluble

APPEARANCE AND ODOR

White crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

METHOD USED

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
O-chlorobenzaldehyde

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic No

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, skin, inhalation

SKIN AND EYE IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Eye irritation, headache, drowsiness, gastroenteric distress,

pulmonary edema

EFFECTS OF CHRONIC EXPOSURE
Anemia, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid; wash eyes & skin; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

228-3635B
PRODUCT DESIGNATION
03-228-3665
P-chlorobenzaldehyde

MATERIAL SAFETY
DATA SHEET

SECTION I  SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)
TRADE NAME AND SYNONYMS
CHEMICAL NAME AND SYNONYMS
P-chlorobenzaldehyde

FORMULA
Cl C₆H₄CHO

SECTION II  HAZARDOUS INGREDIENTS
BASIC MATERIAL
APPROXIMATE OR MAXIMUM % WT. OR VOL.
ESTABLISHED OSHA STANDARD
LD₅₀
LC₅₀
ORAL PERCUT. SPECIES CONC.
None available

SECTION III  PHYSICAL DATA
MW - 140.57
BOILING POINT 213°F
VAPOR PRESSURE mm Hg.
MELTING POINT 48°C
VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H₂O = 1) EVAPORATION RATE (------ = 1)
1.12
SPECIES
UPPER
LOWER
SOLUBILITY IN WATER Pts/100 pts H₂O VOLATILE % Vol. % Wt.
Soluble in hot water
APPEARANCE AND ODOR
White needle-like crystals

SECTION IV  FIRE AND EXPLOSION HAZARD DATA
FLASH POINT Not available
METHOD USED
FLAMMABLE (EXPLOSIVE) LIMITS
UPPER
LOWER
EXTINGUISHING MEDIA
Foam, carbon dioxide, dry chemical
SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
13 10-74

228-3665A
**SECTION V HEALTH HAZARD DATA**

**PRODUCT DESIGNATION**
P-chlorobenzaldehyde

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td>No</td>
</tr>
</tbody>
</table>

**PRINCIPLE ROUTES OF ABSORPTION**
Ingestion, skin, inhalation of dust

<table>
<thead>
<tr>
<th>SKIN AND EYE IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>moderate</td>
</tr>
</tbody>
</table>

**RELEVANT SYMPTOMS OF EXPOSURE**
Eye irritation, headache, drowsiness, gastroenteric distress, pulmonary edema

**EFFECTS OF CHRONIC EXPOSURE**
Anemia, dermatitis

**EMERGENCY AND FIRST AID PROCEDURES**
If swallowed - induce vomiting, get medical aid; wash eyes & skin; inhalation - rest.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATABILITY (MATERIALS TO AVOID)**

**UNSTABLE OR DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

**PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE**

**MECHANICAL (GENERAL)**

**Goggles**

<table>
<thead>
<tr>
<th>CLOVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber</td>
</tr>
</tbody>
</table>

**SPECIAL RESPIRATOR**

**OTHER PROTECTIVE EQUIPMENT**

**WILL PROPER FILTER**

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

228-3665B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

PRODUCT DESIGNATION
03-228-4105
Chlorobenzene

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

Chlorobenzol

CHEMICAL NAME AND SYNONYMS

Phenyl chloride

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD$_{50}$ mg/kg

LC$_{50}$

ORAL PERCUT. SPECIES CONC.

2910 Rat

2830 Rabbit

SECTION III PHYSICAL DATA

MW = 112.56

BOILING POINT $^\circ F$

131.7

VAPOR PRESSURE at 22.2$^\circ C$

10 mm Hg.

MELTING POINT $^\circ F$

-55.6

VAPOR DENSITY (Air = 1)

3.88

SPECIFIC GRAVITY (H$_2$O = 1)

1.113

EVAPORATION RATE (L$_{10}$ mm Hg.

1.113

SOLUBILITY IN WATER Pts/100 pts H$_2$O

VOLATILE % Vol.

% Wt.

APPEARANCE AND ODOR

Clear colorless liquid with aromatic odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

85$^\circ F$

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER 7.1%

LOWER 1.3%

METHOD USED

Closed Cup

EXTINGUISHING MEDIA

Carbon dioxide; dry chemical, foam, water spray

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Chlorobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLU - 75 PPM, 350 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Cyanosis, deep & rapid respiration, irregular pulse, drowsiness, unconsciousness

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, deep & rapid respiration, irregular pulse, drowsiness, unconsciousness

EFFECTS OF CHRONIC EXPOSURE
Lung, liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - remove from exposure, rest; if swallowed - wash mouth, give emetic, get medical aid; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb spill with paper towels and evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

GLOVES

Polyvinyl alcohol

RESPIRATOR

Self contained breathing apparatus

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in tightly closed containers and protect against physical damage.

OTHER PRECAUTIONS

SIGNATURE

DATE

228-4105B
**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>TRADE NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOURCE AND NOMENCLATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER, STREET, CITY, STATE, ZIP CODE</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-Chlorobenzonitrile</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL FAMILY</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CIC₆H₄CN</td>
</tr>
</tbody>
</table>

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LC₅₀ SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ESTABLISHED OSHA STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>Percut.</td>
</tr>
<tr>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>TRAINEE NAME</th>
<th>SYNONYMS</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
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</tbody>
</table>

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW - 137.57</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>BOILING POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>223°C.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VAPOR PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm Hg.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>94°C.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER Pts/100 pts H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VOLATILE % Vol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Wt.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>White crystals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SECTION IV  FIRE AND EXPLOSION HAZARD DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPPER</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear self-contained breathing apparatus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UCN-11322</th>
<th>220-4605A</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3 10-74)</td>
<td></td>
</tr>
</tbody>
</table>

DI280000
**PRODUCT DESIGNATION**

P Chlorobenzonitrile

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**  
None available

**PRINCIPLE ROUTES OF ABSORPTION**  
Inhalation, ingestion, skin

**SKIN AND EYE IRRITATION**  
Mild to moderate

**RELEVANT SYMPTOMS OF EXPOSURE**  
Dizziness, rapid respiration, headache, drowsiness, drop in blood pressure, rapid pulse.

**EFFECTS OF CHRONIC EXPOSURE**  
Dizziness, weakness, eye irritation, lung congestion, weight and appetite loss, mental degradation.

**EMERGENCY AND FIRST AID PROCEDURES**  
If swallowed - amyl nitrite inhalation, induce vomiting, get medical aid; wash skin & eyes; inhalation - rest.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

**HAZARDOUS DECOMPOSITION PRODUCTS**  
Cyanides

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS</th>
<th>LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MECHANICAL (GENERAL)</strong></td>
<td></td>
<td>Goggles</td>
</tr>
<tr>
<td><strong>SPECIAL</strong></td>
<td></td>
<td>Rubber</td>
</tr>
<tr>
<td><strong>RESPIRATOR</strong></td>
<td></td>
<td>With proper filter</td>
</tr>
</tbody>
</table>

**OTHER PROTECTIVE EQUIPMENT**  
Protective apron

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**  
Outside or detached storage preferred, inside storage in standard flammable liquids storage cabinet.

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

228-4605B
**PRODUCT DESIGNATION**
03-228-5635
O-chlorobenzoyl chloride

**MATERIAL SAFETY DATA SHEET**

### SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<table>
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<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2 chlorobenzoyl chloride</td>
<td>C\textsubscript{6}H\textsubscript{5}COCl</td>
</tr>
</tbody>
</table>

### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD\textsubscript{50}</th>
<th>LC\textsubscript{50}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

| None available |

### SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>MW - 175.02</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>230 °F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>-4°C</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H\textsubscript{2}O = 1)</th>
<th>EVAPORATION RATE ( ) = 1</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H\textsubscript{2}O</th>
<th>VOLATILE</th>
</tr>
</thead>
</table>

Decomposes

**APPEARANCE AND ODOR**

Colorless liquid - fumes

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>N/A</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>WATER SPRAY, FOAM, CARBON DIOXIDE OR DRY CHEMICAL</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UPPER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th>Full protective clothing</th>
</tr>
</thead>
</table>

| UNUSUAL FIRE AND EXPLOSION HAZARDS | |
|------------------------------------| |

UCN-11322
(3  10-74)

228-5635A
PRODUCT DESIGNATION
O-Chlorobenzoyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritates respiratory system, skin & eye burns, mouth and digestive tract burns.

EFFECTS OF CHRONIC EXPOSURE
-

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, artificial respiration if needed; if swallowed - drink water, milk of magnesia, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
-

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION
-

INCOMPATABILITY (MATERIALS TO AVOID)
dimethyl sulfoxide

HAZARDOUS DECOMPOSITION PRODUCTS
When heated, phosgene in produced

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
-

WASTE DISPOSAL METHOD
-

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
-

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
-

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry, well-ventilated room.

OTHER PRECAUTIONS
-

SIGNATURE DATE
-

228-5635B
PRODUCT DESIGNATION
03-228-5665
P-Chlorobenzoyl Chloride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

1,4 Chlorobenzoyl Chloride

FORMULA

C16H8Cl2COCl

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
BASIC MATERIAL OR MAXIMUM OSHA STANDARD LD50 LC50
% WT. OR VOL. ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA MW-175.02

BOILING POINT 221 °C 0 °F.

MELTING POINT 16 °C 0 °F.

SPECIFIC GRAVITY (H2O = 1) 1.38

VAPOR PRESSURE VAPOR DENSITY (Air = 1) EVAPORATION RATE ( =1)

SOLUBILITY IN WATER Volts/100 pts H2O VOLATILE % Vol. % Wt.

Decomposes

APPEARANCE AND ODOR

Colorless liquid - fumes

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A

METHOD USED

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

228-5665A
**PRODUCT DESIGNATION**
P-Chlorobenzoyl Chloride

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**  
None available

**CARCINOGENIC**  
No

**PRINCIPLE ROUTES OF ABSORPTION**  
Inhalation, ingestion

**SKIN AND EYE IRRITATION**  
Severe

**RELEVANT SYMPTOMS OF EXPOSURE**  
Irritates respiratory system, skin & eye burns, mouth and digestive tract burns.

**EFFECTS OF CHRONIC EXPOSURE**

**EMERGENCY AND FIRST AID PROCEDURES**  
Inhalation - rest, artificial respiration as needed; ingestion - drink water, milk of magnesia, get medical aid; wash eyes & skin.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**
Dimethyl Sulfoxide

**HAZARDOUS DECOMPOSITION PRODUCTS**
When heated, phosgene is produced

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

**PROTECTIVE EQUIPMENT (SPECIFY TYPES)**

**EYE**
Goggles

**MECHANICAL (GENERAL)**
Gloves

**SPECIAL**
Respirator With proper filter

**OTHER PROTECTIVE EQUIPMENT**

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**
Store in cool, dry, well-ventilated location.

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

228-5665B
PRODUCT DESIGNATION
03-228-6105
O-Chlorobenzyl Chloride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

1,2 Chlorobenzyl Chloride

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
% WT. OR VOL.

LD₅₀

LC₅₀

ESTABLISHED
OSHA
STANDARD

ORAL
PERCUT.
SPECIES
CONC.

None available

SECTION III PHYSICAL DATA

MW-161.08

BOILING POINT 219°C

VAPOR PRESSURE 0 F.

mm Hg.

VAPOR DENSITY (Air = 1)

5.55

SPECIFIC GRAVITY (H₂O = 1)

1.27

EVAPORATION RATE 1

SOLUBILITY IN WATER Pts/100 pts H₂O

Insoluble

VOLATILE % Vol.

% Wt.

APPEARANCE AND ODOR Clear liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A

METHOD USED

FLAMMABLE EXPLOSIVE)

UPPER LIMITS

LOWER

EXTINGUISHING MEDIA

Water spray, dry chemical, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

228-6105A
PRODUCT DESIGNATION
O-Chlorobenzyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

Skin and Eye Irritation

SKIN AND EYE IRRITATION
High

RELEVANT SYMPTOMS OF EXPOSURE
Eye, nose & throat irritation; severe burns to mouth and digestive tract if swallowed.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
If inhaled - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION
May undergo exothermic condensation in presence of copper aluminum, iron, zinc, magnesium, tin and other metals.

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Flush spills with large quantities of water and ventilate area to remove vapors.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE Goggles

GLOVES Rubber

RESPIRATOR With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

228-6105B
**PRODUCT DESIGNATION**
03-228-6605
M-Chlorobromobenzene

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3 Chlorobromobenzene</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ClC₆H₄Br</td>
</tr>
</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| ORAL PERCUT. SPECIES CONC. |
|---------------------------|-----------------|---------------------|-----|
|                            | None            | available          |

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW 191.47</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>196°C</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-21°C</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.63</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Prs/100 pts H₂O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
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</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>White crystal</td>
</tr>
</tbody>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

| FLAMMABLE (EXPLOSIVE) LIMITS |
|------------------------------|-----------------|----------------|
| FLAMMABLE                     | UPPER | LOWER |
| N/A                           |       |       |

<table>
<thead>
<tr>
<th>METHOD USED</th>
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<tbody>
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<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water spray, carbon dioxide, foam, dry chemical</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear goggles and self-contained breathing apparatus.</td>
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</tbody>
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**UNUSUAL FIRE AND EXPLOSION HAZARDS**

<table>
<thead>
<tr>
<th>UCN-11322</th>
</tr>
</thead>
<tbody>
<tr>
<td>228-6605A</td>
</tr>
</tbody>
</table>

(3 10-74)
PRODUCT DESIGNATION
M Chlorobromobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, deep rapid respiration, irregular pulse, drowsiness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Lung, liver & kidney damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic; get medical aid; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles
GLOVES Polyvinyl alcohol
RESPIRATOR With proper filter

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE  DATE

228-6605B
PRODUCT DESIGNATION
03-228-6665
4 Chlorobromobenzene

SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
1, 4 Chlorobromobenzene

CHEMICAL NAME AND SYNONYMS
P Chlorobromobenzene

FORMULA
ClC₆H₄Br

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀  LC₅₀

ORAL PERCUT. SPECIES CONC.
none available

SECTION III  PHYSICAL DATA

MW - 191.47

BOILING POINT
196°F.

MELTING POINT
67°F.

SPECIFIC GRAVITY (H₂O = 1)
1.58

SOLUBILITY IN WATER
Insoluble

APPEARANCE AND ODOR
White crystal

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
N/A

METHOD USED

EXTINGUISHING MEDIA

Water spray, carbon dioxide, foam, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
4 Chlorobromobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Cyanosis, deep and rapid respiration, irregular pulse,
drowsiness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Lung, liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL Polyvinyl Alcohol

RESPIRATOR Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

228-6665B
## SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td>G Chlorobutynitrile</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
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</thead>
<tbody>
<tr>
<td>G Chlorobutynitrile</td>
<td>Cl CH₂CH₂CH₂CN</td>
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## SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
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</thead>
<tbody>
<tr>
<td></td>
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</table>

## SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>MW - 103.55</th>
<th>Boiling Point 198°C</th>
<th>Vapor Pressure at 96°C 25 mm Hg.</th>
<th>Vapor Density (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Gravity (H₂O = 1) 1.16</th>
<th>Evaporation Rate (___________ = 1)</th>
<th>Solubility in Water Pts/100 pts H₂O Insoluble</th>
<th>Appearance and Odor Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

## SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Flash Point</th>
<th>None available</th>
<th>Flammable (Explosive) Limits</th>
<th>Upper</th>
<th>Lower</th>
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</thead>
<tbody>
<tr>
<td>Method Used</td>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
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<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Self-contained breathing apparatus.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION

G-Chlorobutynitrile

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

Carcinogenic No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

Skin and Eye Irritation Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Dizziness, rapid respiration, headache, drowsiness, drop in blood pressure, pulse, delayed symptoms.

EFFECTS OF CHRONIC EXPOSURE

Eye irritation, loss of appetite and weight, mental deterioration.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - inhalation of amyl nitrite, induce vomiting or gastric lavage; wash skin & eyes; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

When heated to decomposition emits highly toxic cyanide fumes.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Absorb with paper towels - evaporate in hood.

WASTE DISPOSAL METHOD

Add excess alcoholic sodium hydroxide, after one hour, evaporate alcohol, then add calcium hypochloride.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

GLOVES

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

Protective apron.

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

Gloves

Rubber

Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

228-7105B
PRODUCT DESIGNATION
Chloroform (trichloromethane)
03-228-9135
03-228-9215

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)
TRADE NAME AND SYNONYMS
CHEMICAL NAME AND SYNONYMS

SECTION II HAZARDOUS INGREDIENTS
BASIC MATERIAL | APPROXIMATE OR MAXIMUM % WT. OR VOL. | ESTABLISHED OSHA STANDARD | LD<sub>50</sub> mg/kg ORAL | LC<sub>50</sub> 2/C.M. SPECIES CONC. | PERCUT.
--- | --- | --- | --- | --- | ---
TCLO - inhalation - human | 5000 mg/C.M./min. | | 300 | Rat |
TCLO - " " " | 1000 mg/C.M./year | | | Mouse 28 |
LDLO oral - human | 140 mg/kg | | | Dog 100 |
|

SECTION III PHYSICAL DATA
Mol. Wt. 119.39
BOILING POINT 61.26°C 100 mm Hg.
MELTING POINT 142.2°F
SPECIFIC GRAVITY (H<sub>2</sub>O = 1) 1.49845 @ 15°C
SOLUBILITY IN WATER Pts/100 pts H<sub>2</sub>O
APPEARANCE AND ODOR

Heavy, water-white, volatile, sweet-tasting liquid with characteristic odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA
FLASH POINT Not flammable
METHOD USED
EXTINGUISHING MEDIA
Water, foam, CO<sub>2</sub>, etc.
SPECIAL FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS
Emits toxic and irritating fumes.
PRODUCT DESIGNATION
Chloroform

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 25 ppm, 120 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of vapor, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
Vapor has anesthetic properties, causing drowsiness, giddiness, headache, nausea, vomiting, unconsciousness; can cause conjunctivities if vapor contacts eyes.

EFFECTS OF CHRONIC EXPOSURE
Liver damage, followed sometimes by jaundice and cirrhosis of the liver.

EMERGENCY AND FIRST AID PROCEDURES
Remove volatile anesthetic by artificial respiration, make patient rest, keep warm, obtain medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
Alkali metals, acetone, aluminum, disilane, magnesium, nitrogen tetroxide, sodium methylate.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles
GLOVES Rubber
RESPIRATOR w/appropriate filter

OTHER PROTECTIVE EQUIPMENT
Self-contained breathing apparatus, protective clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in tightly closed containers away from direct sunlight, protect container against physical damage.

OTHER PRECAUTIONS

SIGNATURE

DATE

228-9135B
PRODUCT DESIGNATION
03-228-9605
2 Chloro-5-Hydroxytoluene

MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
6 Chloro-M-Cresol

FORMULA
C\(_1\)(C\(_6\)H\(_3\))(OH)CH\(_3\)

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) ORAL</th>
<th>LC(_{50}) PERCU.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>None Available</td>
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SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>235(^0)C.</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>66(^0)C.</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H(_2)O = 1)</td>
<td>1.4259</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>0.38 pts/100 pts H(_2)O</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>White crystals</td>
</tr>
</tbody>
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SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
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</thead>
<tbody>
<tr>
<td>FLASH POINT</td>
<td>None available</td>
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<tr>
<td>METHOD USED</td>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
</tr>
<tr>
<td>EXTINGUISHING MEDIA</td>
<td></td>
</tr>
<tr>
<td>SPECIAL FIRE FIGHTING PROCEDURES</td>
<td></td>
</tr>
<tr>
<td>UNUSUAL FIRE AND EXPLOSION HAZARDS</td>
<td></td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
2 Chloro-5-Hydroxytoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin irritation, sensitizes, irritation of digestive tract, C.N.S. depression, convulsions.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Wash eyes and skin; if swallowed - gastric lavage with olive oil, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE
Safety goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL
RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

228-9605B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL | APPROXIMATE OR MAXIMUM % WT. OR VOL. | ESTABLISHED OSHA STANDARD | LD$_{50}$ | LC$_{50}$ | ORAL | PERCUT. | SPECIES | CONC.

SECTION III PHYSICAL DATA

MW = 238.47

BOILING POINT | °F. | VAPOR PRESSURE at 114°C | mm Hg. | 14

MELTING POINT | °F. | VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H$_2$O = 1) |  | EVAPORATION RATE (________ = 1)

SOLUBILITY IN WATER | Pts./100 pts. H$_2$O | VOLATILE | % Vol. | % Wt.

APPEARANCE AND ODOR

Yellow liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT | N/A | FLAMMABLE (EXPLOSIVE) LIMITS | UPPER | LOWER

EXTINGUISHING MEDIA

Water spray, carbon dioxide, foam dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

229-0206A
SECTION V  HEALTH HAZARD DATA

PRODUCT DESIGNATION
M-Chloroiodobenzene

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin
SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, deep & rapid respiration; irregular pulse, drowsiness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Lung, liver & kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles

MECHANICAL (GENERAL)

GLOVES
Polyvinyl gloves

SPECIAL

RESPIRATOR
With proper filter

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

229-0206B
PRODUCT DESIGNATION
03-229-0236
O-Chloroiodobenzene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2 Chloro Iodobenzene

FORMULA

C_6H_4I

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE OR MAXIMUM ESTABLISHED LD_50 LC_50
BASIC MATERIAL % WT. OR VOL. OSHA STANDARD ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW = 238.47

BOILING POINT 0 F. VAPOR PRESSURE mm Hg.

234

MELTING POINT 0 F. VAPOR DENSITY (AIR = 1)

0.7

SPECIFIC GRAVITY (H_2O = 1) EVAPORATION RATE ( = 1)

1.95

SPECIES CONC.

SOLUBILITY IN WATER Pts/100 pts H_2O VOLATILE % Vol. % WT.

APPEARANCE AND ODOR Colorless oil

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

METHOD USED

EXTINGUISHING MEDIA

Water spray, carbon dioxide, foam, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

229-0236A
PRODUCT DESIGNATION
O-Chloroiodobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, deep & rapid respiration; irregular pulse, drowsiness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Liver, lung & kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic; get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Polyvinyl alcohol

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

229-0236B
### SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
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<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Family</th>
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<tbody>
<tr>
<td>4 Chloro Iodobenzene</td>
<td>ClC₆H₄I</td>
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### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate % Wt. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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### SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Boiling Point °F.</td>
<td>228</td>
</tr>
<tr>
<td>Melting Point °C</td>
<td>56</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.89</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>White solid</td>
</tr>
</tbody>
</table>

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Flammable Limits</th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Extinguishing Media**

Water spray, carbon dioxide, foam, dry chemical

**Special Fire Fighting Procedures**

Wear goggles and self-contained breathing apparatus.

**Unusual Fire and Explosion Hazards**

UCN-11322
(3 10-74)
PRODUCT DESIGNATION

P-Chloroiodobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

Carcinogenic

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE IRRITATION

Severe

RELEVANT SYMPTOMS OF EXPOSURE

Cyanosis, deep and rapid respiration, irregular pulse, drowsiness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE

Lung, liver & kidney damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - give emetic, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

GLOVES

Polyvinyl gloves

RESPIRATOR

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

229-0266B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

1,1 Chloronitropropane

FORMULA

C₇H₅ClNO₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED
OSHA STANDARD

LD₅₀

LC₅₀

LDLO - oral - human - 50 mg/kg

510

Mouse

50

Rabbit

SECTION III PHYSICAL DATA

MW = 123.54

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

140°C

at 20°C

5.8

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

4.26

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE ( 

1.21

SOLUBILITY IN WATER, Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

144

METHOD USED

O.C.

EXTINGUISHING MEDIA

Alcohol foam, water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

May explode when heated

UCN-11322

229-3216A
PRODUCT DESIGNATION

1 Chloro-1-Nitropropane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 20 PPM, 100 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Irritation of respiratory system, lung, liver, heart muscle and kidney damage.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - induce vomiting, get medical aid; wash skin & eyes; inhalation - give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

May explode when heated

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Oxidizing material

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Cover spill with soda ash, spray and mix with water.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

Protective clothing made of plastic.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

229-3216B
PRODUCT DESIGNATION
03-229-4216
M-Chlorophenol

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
3 Chloro-1 hydroxybenzene

CHEMICAL NAME AND SYNONYMS
M chlorophenol

CHEMICAL FAMILY
Cl C₆H₄OH

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

LD₅₀ ORAL PERCU T SPECIES CONC.
570 rat

SECTION III PHYSICAL DATA
MW - 128.56

BOILING POINT 214°C. 0°F.
MELTING POINT 33°C.
SPECIFIC GRAVITY (H₂O = 1) 1.27
SOLUBILITY IN WATER 2.6 Pts/100 pts H₂O

APPEARANCE AND ODOR Needle-like crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA
None available

METHOD USED
EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
M-Chlorophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Eye skin and mucous membrane irritation,
dermatitis, cyanosis.

EFFECTS OF CHRONIC EXPOSURE
Liver damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; wash from skin & eyes; if swallowed -
give emetic, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Put a mixture of sand 9 and 1 soda ash. Put into box for disposal.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)

GLOVES
Butyl Rubber

SPECIAL
RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry place.

OTHER PRECAUTIONS

SIGNATURE

DATE

229-4216B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
1. Chloro-1 Hydroxybenzene
2. O-chlorophenol

CHEMICAL FAMILY

FORMULA
Cl C₆H₅OH

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED LD₅₀ mg/kg LC₅₀
BASIC MATERIAL OR MAXIMUM% WT. OR VOL. OSHA STANDARD SPECIES CONC.

SECTION III PHYSICAL DATA

MW-128.56

ROILING POINT 176°F. VAPOR PRESSURE at 12°C. mm Hg.

MELTING POINT 7°F. VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1) EVAPORATION RATE ( ________ = 1)
1.24

SOLUBILITY IN WATER Pts/100 pts H₂O VOLATILE % Vol. % Wt.
2.8

APPEARANCE AND ODOR
Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 147°F.

METHOD USED

EXTINGUISHING MEDIA:
Alcohol foam, carbon dioxide - dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

229-4246A
PRODUCT DESIGNATION
O-Chlorophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic Neoplastic

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin and mucous membrane irritation dermatitis, cyanosis.

EFFECTS OF CHRONIC EXPOSURE
Liver damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; wash from skin & eyes; if swallowed - give emetic, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Put sand-soda ash (9:1) mixture on spill and sweep into box for disposal.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Butyl rubber

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT

Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry place.

OTHER PRECAUTIONS

SIGNATURE DATE

229-4246B
MATERIAL SAFETY DATA SHEET

PRODUCT DESIGNATION
03-229-4276
P-Chlorophenol

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
P-Chlorophenol

FORMULA
Cl C₆H₄OH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
APPROXIMATE OR MAXIMUM % WT. OR VOL.
ESTABLISHED OSHA STANDARD
LD₅₀ g/kg
LC₅₀ % Vol.
ORAL PERCUT.

SECTION III PHYSICAL DATA
MW - 128.56

BOILING POINT
217°C. 0°F. VAPOR PRESSURE

MELTING POINT
43°C. 0°F. VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

SOLUBILITY IN WATER

APPEARANCE AND ODOR
Needle-like crystals, straw colored, unpleasant odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
250°F.

METHOD USED

EXTINGUISHING MEDIA
Alcohol foam, dry chemical, carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
P-Chlorophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin and mucous membrane irritation dermatitis, cyanosis.

EFFECTS OF CHRONIC EXPOSURE
Liver damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; wash from skin & eyes. If swallowed - give emetic, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Pour a mixture of sand to soda ash (9:1) on spill and sweep into box for disposal.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Butyl Rubber

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry place.

OTHER PRECAUTIONS

SIGNATURE

DATE

229-4276B
**PRODUCT DESIGNATION**

03-229-4716
M-Chlorophenyl Isocyanate

---

**SECTION I**

**MATERIAL SAFETY DATA SHEET**

**SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>ClC₆H₄NCO</td>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M-Chlorophenyl Isocyanate</td>
</tr>
</tbody>
</table>

**SECTION II**

**HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/CM</th>
<th>LC₅₀ SPECIES CONC.</th>
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</thead>
<tbody>
<tr>
<td>TCLO - ocular-human</td>
<td>1 ppm/1 minute eye</td>
<td>4760</td>
<td>Rat</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>530</td>
<td>Mouse</td>
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**SECTION III**

**PHYSICAL DATA**

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<tr>
<th>MW</th>
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<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE at 77° C.</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>101° C. at 30 min.</td>
<td></td>
<td></td>
<td>100</td>
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</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-4° C.</td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (1 = 1)</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
<th>VOLATILE % Vol. % Wt.</th>
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</thead>
<tbody>
<tr>
<td></td>
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</table>

**APPEARANCE AND ODOR**

Water white liquid.

**SECTION IV**

**FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
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<tr>
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<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear self-contained breathing apparatus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powerful lachrymater.</td>
</tr>
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</table>

UCN-11322
(S 10-74) 229-4716A
PRODUCT DESIGNATION
M-Chlorophenyl Isocyanate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
Skin, eyes and mucous membrane irritation.

EFFECTS OF CHRONIC EXPOSURE
Carcinogenic: No
SKIN AND EYE IRRITATION: Severe

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - oxygen as needed; if swallowed - induce vomiting, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Hazardous Decomposition Products

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Cogrica
GLOVES Rubber
RESPIRATOR Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

229-4716B
**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O-Chlorophenyl Isocyanate</td>
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</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl C₆H₄NCO</td>
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**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
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</thead>
<tbody>
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| None available |

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW - 153.6</th>
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<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>106° C. at 30 min.</th>
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</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th></th>
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<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorless liquid</td>
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</table>

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
</tr>
</thead>
<tbody>
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<td>None available</td>
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<table>
<thead>
<tr>
<th>METHOD USED</th>
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</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
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<tbody>
<tr>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear self-contained breathing apparatus.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powerful lachrymater</td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
O-Chlorophenyl Isocyanate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of skin, eyes and mucous membrane.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - oxygen as needed; if swallowed - induce vomiting, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATION
Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

229-4746B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

α-Chlorohydrin

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE
BASIC MATERIAL

ESTABLISHED
OR MAXIMUM
OSHA
% WT. OR VOL.
STANDARD

LD_{50} \text{mg/kg}

LC_{50}

ORAL
PERCUT.

SPECIES

CONC.

150

5

Rat

Mouse

160

Mouse

SECTION III PHYSICAL DATA

MW 110.54

BOILING POINT

213^\circ C \text{ decomposes}

MELTING POINT

SPECIFIC GRAVITY (H_2O = 1)

1.33

SOLUBILITY IN WATER

Pts/100 pts H_2O

VAPOR PRESSURE

mm Hg.

VAPOR DENSITY (Air = 1)

EVAPORATION RATE ( = 1)

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

N/A

FLAMMABLE
(EXPLOSIVE)

LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
3 Chloro - 1,2 Propanediol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE
eye and nasal irritation, nausea, vomiting, giddiness, dizziness, incoordination, coma

EFFECTS OF CHRONIC EXPOSURE
Nausea, vomiting, abdominal pain

EMERGENCY AND FIRST AID PROCEDURES
Wash eyes and skin; if swallowed - give emetic; get medical aid; inhalation - rest, give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)
GLOVES
Rubber

SPECIAL
RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

229-6466B
PRODUCT DESIGNATION
03-229-7716
β-Chloropropionyl Chloride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

FORMULA

CH₂Cl(C₂H₃)Cl₂

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ORAL PERCUT. SPECIES CONC.</th>
<th>None available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>VAPOUR PRESSURE</th>
<th>MELTING POINT</th>
<th>VAPOUR DENSITY (AIR = 1)</th>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (----- = 1)</th>
<th>SOLUBILITY IN WATER</th>
<th>VOLATILE % VOL.</th>
<th>% WT.</th>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>144°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Insoluble</td>
<td></td>
<td></td>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide, dry chemical</td>
<td></td>
</tr>
</tbody>
</table>

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

229-7716A
**PRODUCT DESIGNATION**

β Chloropropionyl Chloride

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**

None available

**PRINCIPLE ROUTES OF ABSORPTION**

Inhalation, ingestion

**RELEVANT SYMPTOMS OF EXPOSURE**

Cyanosis, coughing, headache, pulmonary edema, ulceration of skin, dizziness.

**EFFECTS OF CHRONIC EXPOSURE**

Erosion of teeth, bronchial irritation and chronic cough.

**EMERGENCY AND FIRST AID PROCEDURES**

Ingestion - drink water, milk of magnesia, get medical aid; inhalation - artificial respiration as needed; wash eyes & skin.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATABILITY (MATERIALS TO AVOID)**

May react violently with water, alcohol, and dimethyl sulfoxide.

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS**

Local exhaust

**MECHANICAL (GENERAL)**

**SPECIAL**

**OTHER PROTECTIVE EQUIPMENT**

**RESPIRATORY**

Self-contained

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

229-7716B
### SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
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<tbody>
<tr>
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</tr>
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<table>
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<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a chloropyridine</td>
<td>2-chloropyridine</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOURCE AND NOMENCLATURE</th>
<th>MANUFACTURER'S NAME</th>
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</thead>
<tbody>
<tr>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>MATERIAL SAFETY DATA SHEET</th>
<th>SOURCE AND NOMENCLATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tbody>
<tr>
<td>a chloropyridine</td>
<td>2-chloropyridine</td>
</tr>
</tbody>
</table>

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR maximum % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀ CONC. ORAL PERCU. SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCLO</td>
<td>inhalation - rat 250 ppm/7 hrs.</td>
<td></td>
<td>107 Mouse</td>
<td>64 Rabbit</td>
</tr>
</tbody>
</table>

### SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT °F</th>
<th>VAPOR PRESSURE mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>170°C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT °F</th>
<th>VAPOR DENSITY (Air = 1) 3.93</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.21</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER Pts/100 pts H₂O</th>
<th>VOLATILE % Vol. % Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soluble</td>
<td></td>
</tr>
</tbody>
</table>

**APPEARANCE AND ODOR**

Oil with fish-like odor.

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>UPPER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>LOWER</th>
</tr>
</thead>
</table>

**EXTINGUISHING MEDIA**

Alcohol foam, carbon dioxide, dry chemical.

**SPECIAL FIRE FIGHTING PROCEDURES**

Wear goggles and self-contained breathing apparatus.

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

UCN-11322

229-9216A
PRODUCT DESIGNATION
2 Chloropyridine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

CARCINOGENIC
No

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Narcosis, headache, nausea, giddiness, vomiting;
oral - liver & kidney damage.

EFFECTS OF CHRONIC EXPOSURE
Occasional vomiting and diarrhea; weight loss & anemia;
ocular and facial paralysis.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting,
then gastric lavage; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
May react with oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
Use in hood

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles
MECHANICAL (GENERAL)
GLOVES Rubber
SPECIAL
RESPIRATOR Self-contained breathing apparatus

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

229-9216B
PRODUCT DESIGNATION
03-230-0307
M-Chlorotoluene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
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<tr>
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<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Chlorotoluene</td>
<td>CH₃C₆H₄Cl</td>
</tr>
</tbody>
</table>

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ OR MAXIMUM OSHA STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th></th>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>0°F</th>
<th>VAPOR PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>162°C</td>
<td></td>
<td>at 43°C 10 mm Hg.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>0°F</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-48°C</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
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</thead>
<tbody>
<tr>
<td>1.08</td>
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<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Prc/100 pts H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLATILE</td>
<td>% Vol. % Wh.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol foam, carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
</table>

ULN-11322
(3 10-74)

230-0307A
PRODUCT DESIGNATION

M-Chlorotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

Carcinogenic

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

Severe

RELEVANT SYMPTOMS OF EXPOSURE

Eye & respiratory system irritation, severe internal damage, narcotic effect

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

Mechanical (General)

Gloves

SPECIAL

Respirator

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

230-0307B
PRODUCT DESIGNATION
03-230-0337
0-Chlorotoluene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

2 Chlorotoluene

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 / LC50

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW 126.58

BOILING POINT 159°C 0°F.

VAPOR PRESSURE at 43°C 10 mm Hg.

MELTING POINT -37°C 0°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1) 1.08

EVAPORATION RATE ( )

SOLUBILITY IN WATER Pts/100 pts H2O

Insoluble

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

230-0337A
PRODUCT DESIGNATION
O-Chlorotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 50 PPM, 250 mg/C.M.

CARCINOGENIC Neoplastic

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye and respiratory system irritation, severe internal damage.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

230-0337B
PRODUCT DESIGNATION
03-230-0367
P-Chlorotoluene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER’S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
4 Chlorotoluene

FORMULA
CH3C6H4Cl

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LDso

LCso ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

BOILING POINT 160°C

VAPOR PRESSURE at 44°C

mm Hg.

10

MELTING POINT 70°C

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1)

EVAPORATION RATE (________________ = 1)

1.07

SOLUBILITY IN WATER pt/pt H2O

VOLATILE % Vol.

% WT.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

METHOD USED

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
P chlorotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye & respiratory system irritation, severe internal damage if swallowed.

EFFECTS OF CHRONIC EXPOSURE
---

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
---

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION
---

INCOMPATIBILITY (MATERIALS TO AVOID)
---

HAZARDOUS DECOMPOSITION PRODUCTS
---

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
---

WASTE DISPOSAL METHOD
---

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)
GLOVES

SPECIAL
RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
---

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
---

OTHER PRECAUTIONS
---

SIGNATURE

DATE

230-0367B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
1,2 Benzopyrene

CHEMICAL NAME AND SYNONYMS
Coumarin

CHEMICAL FAMILY

FORMULA
CgH502

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 mg/kg

LC50

ORAL PERCUT. SPECIES CONC.

293 Rat

196 242 Mouse

202 Guinea Pig

SECTION III PHYSICAL DATA

MW-146.15

BOILING POINT
299°F.

VAPOR PRESSURE at 106°C.

1 mm Hg.

MELTING POINT
70°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1)

EVAPORATION RATE ( ------- 1)

SOLUBILITY IN WATER Pts/100 pts H2O

VOLATILE % Vol. % Wt.

0.25

APPEARANCE AND ODOR
Orthorhombic crystals with fragrant odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
None available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

EXTINGUISHING MEDIA
Dry chemical, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
**PRODUCT DESIGNATION**

**Coumarin**

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**PRINCIPLE ROUTES OF ABSORPTION**

| Inhalation, ingestion |

**RELEVANT SYMPTOMS OF EXPOSURE**

| May cause excessive bleeding. |

**EFFECTS OF CHRONIC EXPOSURE**

| Disturbs clotting mechanism of the blood. |

**EMERGENCY AND FIRST AID PROCEDURES**

| Wash skin & eyes; if swallowed - gastric lavage, get medical aid. |

**SECTION VI REACTIVITY DATA**

| CONDITIONS CONTRIBUTING TO INSTABILITY |
| CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION |
| INCOMPATIBILITY (MATERIALS TO AVOID) |
| HAZARDOUS DECOMPOSITION PRODUCTS |

**SECTION VII SPILL OR LEAK PROCEDURES**

| STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED |

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECHANICAL (GENERAL)</td>
<td>Goggles</td>
</tr>
<tr>
<td>SPECIAL</td>
<td>Gloves</td>
</tr>
<tr>
<td>OTHER PROTECTIVE EQUIPMENT</td>
<td>Rubber</td>
</tr>
</tbody>
</table>

| RESPIRATOR |

**SECTION IX SPECIAL PRECAUTIONS**

| PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE |

| OTHER PRECAUTIONS |

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>DATE</th>
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</thead>
</table>

230-3307B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

FORMULA

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE OR MAXIMUM ESTABLISHED OSHA STANDARD
% WT. OR VOL. LD₅₀ mg/kg LC₅₀ PPM

TCLO - inhalation - human 200 PPM irritant 1400 Rat 8000 - 4 hr

SECTION III PHYSICAL DATA

MW - 120.19

BOILING POINT 152°C 9°F. VAPOR PRESSURE at 38.3°C 10 mm Hg.

MELTING POINT -96°C 0°F. VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1) EVAPORATION RATE ( = 1)

0.862 VOLATILE % Vol.

SOLUBILITY IN WATER Pts/100 pts H₂O % Wt.

Sections IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 96°F.

METHOD USED Closed Cup

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES Wear goggles and self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS

230-5307A
SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 50 PPM, 245 mg/Kg

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE

Skin and eye irritant, central nervous system depressant, dizziness

EFFECTS OF CHRONIC EXPOSURE

Possible kidney damage

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Absorb on paper, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST MECHANICAL (GENERAL) SPECIAL

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles GLOVES Rubber RESPIRATOR

Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Protect against physical damage - outside storage preferred, inside storage in flammable liquid storage cabinet.

OTHER PRECAUTIONS

SIGNATURE DATE

230-5307B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

CHEMICAL FAMILY

M-Methyl Phenol

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA
STANDARD

LD₅₀ mg/kg

LC₅₀

ORAL PERCUT. SPECIES CONC.

242 620 Rat

2050 Rabbit

828 Mouse

SECTION III PHYSICAL DATA

Mol. Wt. 108.1

BOILING POINT

202.8°C 397 °F.

VAPOR PRESSURE

52°C

1 mm Hg.

MELTING POINT

12°C (53.6)

VAPOR DENSITY (Air = 1)

3.72

SPECIFIC GRAVITY (H₂O = 1)

1.034

EVAPORATION RATE (mm Hg)

1

SOLUBILITY IN WATER

Pts./100 pts. H₂O

VOLATILE

% Vol., % Wt.

APPEARANCE AND ODOR

Colorless to yellowish liquid, phenolic odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

202°F

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Water spray, dry chemical, foam, or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
M-Cresol (skin)

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 5 ppm, 22 mg/C.M.

CARCINOGENIC Neoplastic

PRINCIPLE ROUTES OF ABSORPTION
Inhalation or percutaneous absorption of liquid

SKIN AND EYE
IRRITATION Moderate to severe

RELEVANT SYMPTOMS OF EXPOSURE
Vomiting, collapse, pulmonary edema, nausea, hyperpnea, cyanosis,
swelling, intense thirst, convulsions, diarrhea, and hyperactivity.

EFFECTS OF CHRONIC EXPOSURE
Relatively same as above - may result in liver or kidney damage;
also dermatitis.

EMERGENCY AND FIRST AID PROCEDURES
Remove from exposure; body contact - use large amounts of water
to wash or irrigate. Skin or mucous membranes - also apply 10% ethyl alcohol or caster oil
after washing. Obtain medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper - evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Self-contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry, well-ventilated location, away from any area where the fire hazard
may be acute.

OTHER PRECAUTIONS

SIGNATURE
DATE

230-4307B
CAS: 000095487

PRODUCT DESIGNATION
03-230-4347
O-CRESOL

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
0-Hydroxy Toluene

CHEMICAL NAME AND SYNONYMS
0-Methyl Phenol

CHEMICAL FAMILY

FORMULA
CH₃C₆H₄OH

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
BASIC MATERIAL OR MAXIMUM OSHA STANDARD
% WT. OR VOL.

LD₅₀ mg/kg

LC₅₀ % WT.

PERCUT. SPECIES CONC.

121 Rat

1100 Rabbit

344 Mouse

SECTION III PHYSICAL DATA

BOILING POINT 191°C 0°F. VAPOR PRESSURE at 25°C mm Hg.

VAPOR DENSITY (Air = 1)

31°C 3.72

SPECIFIC GRAVITY (H₂O = 1)

1.05 EVAPORATION RATE (________ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE % Vol. % Wt.

2.5

APPEARANCE AND ODOR

Colorless liquid with sweet tarry odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 178

METHOD USED C.C.

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

1.35

EXTINGUISHING MEDIA
Carbon dioxide, dry chemical foam, water spray

SPECIAL FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
O-Cresol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 5 PPM, 22 mg/C.M.

CARCINOGENIC Neoplastic

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Moderate to severe

RELEVANT SYMPTOMS OF EXPOSURE
Headache, dizziness, nausea, vomiting, stomach pain, exhaustion, irritation to respiratory system, eye burns, coma

EFFECTS OF CHRONIC EXPOSURE
Liver or kidney damage, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, give vegetable oil, get medical aid; if inhaled - rest; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)
GLOVES

SPECIAL
Rubber RESPIRATOR
Self-contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry, well-ventilated area

OTHER PRECAUTIONS

SIGNATURE

DATE

230-4347B
SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

B-Methylacrolein

CHEMICAL NAME AND SYNONYMS

2 Butenal

SECTION II  HAZARDOUS INGREDIENTS

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD$_{50}$ mg/Kg

LC$_{50}$ mg/C.M.

Note:

Lowest published toxic concentration in air:

- Inhalation - human 4.1 PPM

SECTION III  PHYSICAL DATA

MW - 70.09

BOILING POINT 104°C

MELTING POINT -76°C

SPECIFIC GRAVITY (H$_2$O = 1)

0.85

SOLUBILITY IN WATER Pts/100 pts H$_2$O 18

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid, very irritating odor.

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 55

METHOD USED Closed Cup

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER 15.5 %

LOWER 2.1 %

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322 (3 10-74) 230-4807A
PRODUCT DESIGNATION
Crotonaldehyde

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
TLV 2 PPM, 6 mg/c.m.

CARCINOGENIC  No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION  Moderate to severe

RELEVANT SYMPTOMS OF EXPOSURE  Eye & respiratory system irritation, severe gastroenteric distress, pulmonary edema.

EFFECTS OF CHRONIC EXPOSURE  Dermatitis, weight loss

EMERGENCY AND FIRST AID PROCEDURES  If swallowed - induce vomiting, get medical aid; inhalation - give oxygen as needed; wash eyes & skin.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION
At elevated temperatures

INCOMPATIBILITY (MATERIALS TO AVOID)
Avoid - amines, ammonia, hydroxides

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towels; evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MEDIUM GENERAL
GLOVES
Rubber

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool place away from sources of ignition and heat.

OTHER PRECAUTIONS

SIGNATURE  DATE

230-4807B
**SECTION I**  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
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<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
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<tr>
<td>Cyanamide</td>
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<table>
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<th>GS59500</th>
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<table>
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<tr>
<th>SECTION II  HAZARDOUS INGREDIENTS</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rat</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>SECTION III  PHYSICAL DATA</th>
<th>MW - 42.05</th>
</tr>
</thead>
</table>

| BOILING POINT | 260°C. | °F. | 19 mm Hg. |
| MELTING POINT | 45°C.  | °F. | 1.45     |
| SPECIFIC GRAVITY (H₂O = 1) | 1.07 |    |
| SOLUBILITY IN WATER | Pts/100 pts H₂O | Vol. | Wt. |
|                     | Very soluble |       |     |
| APPEARANCE AND ODOR | Deliquescent Crystals |   |     |

<table>
<thead>
<tr>
<th>SECTION IV  FIRE AND EXPLOSION HAZARD DATA</th>
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</table>

<table>
<thead>
<tr>
<th>FLAMMABLE EXPLOSIVE LIMITS</th>
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<tbody>
<tr>
<td>UPPER</td>
</tr>
<tr>
<td>LOWER</td>
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<table>
<thead>
<tr>
<th>METHOD USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water spray, carbon dioxide, dry chemical.</td>
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</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-contained breathing apparatus.</td>
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</table>

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

**UCN-11322**

**230-6307A**
PRODUCT DESIGNATION
Cyanamide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 2 mg/C.M.

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of mucous membranes, dermatitis, flushing of face, headache, dizziness.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION
Polymerizes at 122°C.

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Collect by sweeping with a broom onto a sheet of paper.

WASTE DISPOSAL METHOD
Dispose by burning the paper.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

CLOVES

Long rubber gloves

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry place.

OTHER PRECAUTIONS

SIGNATURE

DATE

230-6307B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Cyclohexyl alcohol

CHEMICAL FORMULA
C₆H₈OH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL LD₅₀ ORAL PERCUT. LC₅₀ SPECIES CONC.

LDLO-oral-human 500 mg/kg 2060 Rat

1. lowest published toxic concentration in air
   inhalation - human 75 ppm irritant

SECTION III PHYSICAL DATA

BOILING POINT 161°C 161°F

MELTING POINT 25°C 77°F

VAPOR PRESSURE at 34°C 3.5 mm Hg

VAPOR DENSITY (Air = 1) 3.46

SPECIFIC GRAVITY (H₂O = 1) EVAPORATION RATE (---= 1)

SPECIFIC GRAVITY 0.96

SOLUBILITY IN WATER Pts/100 pts H₂O

3.6

APPEARANCE AND ODOR
Oily colorless liquid with odor like camphor and alcohol.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 154°C 311°F

METHOD USED CC

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Cyclohexanol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 50 PPM, 200 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Tremors, narcosis, hypothermia

EFFECTS OF CHRONIC EXPOSURE
Possible liver & kidney damage

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation rest; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Cannister mask

OTHER PROTECTIVE EQUIPMENT

Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

230-7447B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀

ORAL PERCUT. SPECIES CONC.

1 lowest published toxic concentration in air

inhalation - human 75 ppm - irritant

2 lowest published lethal concentration in air

inhalation - rat 2000 ppm

SECTION III PHYSICAL DATA

MW 98.16

BOILING POINT

156°C 300°F

VAPOR PRESSURE

38.7°C 10 mm Hg.

MELTING POINT

-45°C 230°F

VAPOR DENSITY (Air = 1)

3.4

SPECIFIC GRAVITY (H₂O = 1)

0.95

EVAPORATION RATE (_______ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

slight

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid - acetone-like odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

111°F

METHOD USED

Closed Cup

EXTINGUISHING MEDIA

Alcohol foam, dry chemical, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

230-7507A
PRODUCT DESIGNATION
Cyclohexanone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 50 PPM, 200 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Narcotic symptoms, tearing, lowering of body temperature and heart rates, opacity of cornea.

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - gastric lavage, medical aid; wash skin & eyes; inhalation - give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper; allow to evaporate in hood.

WASTE DISPOSAL METHOD
Mix with a more flammable solvent and burn.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
Work clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry place.

OTHER PRECAUTIONS

SIGNATURE

DATE

230-7507B
## SECTION I SOURCE AND Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
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<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrahydrobenzene</td>
<td></td>
</tr>
<tr>
<td>Cyclohexene</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Chemical Name and Synonyms</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexene</td>
<td>C₆H₁₀</td>
</tr>
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</table>

## SECTION II Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard</th>
<th>Species</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>Mouse</td>
<td>2300</td>
</tr>
</tbody>
</table>

## SECTION III Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>83°C</td>
<td></td>
</tr>
<tr>
<td>Melting Point</td>
<td>-104°C</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>0.81</td>
<td>Very slightly soluble</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td></td>
<td>mm Hg</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate (</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* = 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solubility in Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid</td>
<td></td>
</tr>
</tbody>
</table>

## SECTION IV Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>&lt;20°F</td>
<td></td>
</tr>
<tr>
<td>Method Used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Dry chemical, carbon dioxide.</td>
<td></td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td>Water may be ineffective.</td>
<td></td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td>Forms explosive peroxides with oxygen.</td>
<td></td>
</tr>
</tbody>
</table>

UCN-11322 (3-10-74) 230-7607A
PRODUCT DESIGNATION
Cyclohexene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 300 PPM, 1015 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes and mucous membranes.

EFFECTS OF CHRONIC EXPOSURE
SKIN AND EYE IRRITATION Yes

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
Reacts with oxygen to produce explosive peroxides shelf life - 12 months.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

230-7607B
**PRODUCT DESIGNATION**
03-230-7807
Cyclohexylamine

**SECTION I SOURCE AND NOMENCLATURE**

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Aminocyclohexane

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50} mg/Kg</th>
<th>LC_{50}</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 - oral - human</td>
<td>50 mg/kg</td>
<td></td>
<td>710</td>
<td>Rat</td>
</tr>
<tr>
<td>LC50 - oral - human</td>
<td>320 mg/kg</td>
<td></td>
<td>320</td>
<td>Rabbit</td>
</tr>
</tbody>
</table>

**SECTION III PHYSICAL DATA**

MW-99.20

ROILING POINT 
173°F
MELTING POINT 
-18°C
SPECIFIC GRAVITY (H₂O = 1) 
0.87
SOLUBILITY IN WATER 
Pts/100 pts H₂O

VAPOR PRESSURE 
mm Hg.

VAPOR DENSITY (Air = 1) 
3.42
EVAPORATION RATE (Air = 1)

VOLATILE
%

APPEARANCE AND ODOR
Colorless to yellow ammonia-like odor.

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT 
90°F
METHOD USED 
O.C.

FLAMMABLE (EXPLOSIVE) LIMITS
UPPER
LOWER

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
Wear goggles and self-contained breathing apparatus. Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Cyclohexylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 10 PPM, 40 mg/C.M.

Mutagen CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE
Drowsiness, anxiety, nausea, vomiting, slurred speech, convulsions and dermatitis

EFFECTS OF CHRONIC EXPOSURE
Weight loss, corneal opacity.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; wash eyes & skin; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles
MECHANICAL (GENERAL) GLOVES
SPECIAL Butyl Rubber Gloves

Self-contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT
All purpose cannister mask, working clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside or detached storage preferred; protect container against physical damage.

OTHER PRECAUTIONS

SIGNATURE DATE

230-7807B
# Product Designation

03-234-0108
Decahydronapthalene

# Material Safety Data Sheet

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
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<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, ZIP Code)</th>
<th>Chemical Family</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Decalin</td>
</tr>
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</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum</th>
<th>Established OSHA Standard</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCLO - Inhalation - Human</td>
<td>100 PPM - Irritant</td>
<td></td>
<td>4170</td>
<td>Rat</td>
</tr>
</tbody>
</table>

Least published lethal concentration in air inhalation - Rat - 500 PPM - 2 hrs.

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>138.25</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>193°C (376°F)</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-43°C (27°F)</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>0.9</td>
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<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Water white liquid</td>
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## Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>136°F (281°F)</td>
</tr>
<tr>
<td>Method Used</td>
<td>Foam, carbon dioxide, dry chemical</td>
</tr>
<tr>
<td>Upper Flammable Limits</td>
<td>4.9%</td>
</tr>
<tr>
<td>Lower Flammable Limits</td>
<td>0.7%</td>
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</table>

## Unusual Fire and Explosion Hazards

UCN-11322
(3 10-74)
PRODUCT DESIGNATION
Decahydronaphthalene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 25 PPM (suggested)

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Lung congestion

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage, cataract

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - get medical aid; inhalation - give oxygen as needed; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

234-0108B
**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,4 diaminoanisole dihydrochloride</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
<th>2(C6H3(NH2)2)2H</th>
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</table>

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50 ORAL</th>
<th>PERCUT.</th>
<th>LC50 SPECIES</th>
<th>CONC.</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<td>None available</td>
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**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
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<tbody>
<tr>
<td></td>
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</tr>
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</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
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<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H2O = 1)</th>
<th>EVAPORATION RATE ( ) = 1</th>
</tr>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H2O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Very soluble</td>
<td></td>
<td></td>
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</table>

**APPEARANCE AND ODOR**

- Tan Crystals

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
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</tbody>
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<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water spray, alcohol foam, dry chemical.</td>
<td></td>
</tr>
</tbody>
</table>

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

- Emits toxic fumes when heated to decomposition point.
PRODUCT DESIGNATION

2,4-diaminoanisole dihydrochloride

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL

None available

Carcinogenic: Yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION: Severe

RELEVANT SYMPTOMS OF EXPOSURE

Headache, drowsiness, cyanosis, skin irritant.

EFFECTS OF CHRONIC EXPOSURE

Increase of sulphemoglobin, methemoglobin

EMERGENCY AND FIRST AID PROCEDURES

Wash skin and eyes; if swallowed - give emetic, get medical aid; inhalation - rest.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL, METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety goggles

GLOVES

Butyl

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

Neoprene protective clothing.

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

234-4108B
PRODUCT DESIGNATION
03-234-4608
1,4-Diaminobutane
Dihydrochloride

MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER’S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
Putrescine hydrochloride

FORMULA
H₂N(CH₂)₄NH₂·2HCl

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
</table>
|                |                                      |                           | None | available

SECTION III PHYSICAL DATA

MW - 161.08

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_______ = 1)

SOLUBILITY IN WATER

Pts/100 pts H₂O

VOLATILE % Vol.

% Wt.

Very

APPEARANCE AND ODOR
White crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
Not available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
**PRODUCT DESIGNATION**

1,4-Diaminobutane Dihydrochloride

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRINCIPLE ROUTES OF ABSORPTION</th>
<th>SKIN AND EYE IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingestion, inhalation, skin</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RELEVANT SYMPTOMS OF EXPOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nose, throat &amp; eye irritation, headache, skin &amp; eye burns, depression of blood pressure, convulsions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EFFECTS OF CHRONIC EXPOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermatitis</td>
</tr>
</tbody>
</table>

**EMERGENCY AND FIRST AID PROCEDURES**  
Inhalation - rest; if swallowed - drink water, get medical aid; wash skin & eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATABILITY (MATERIALS TO AVOID)**

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS</th>
<th>LOCAL EXHAUST</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</td>
<td></td>
</tr>
<tr>
<td>Eye Goggles</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td></td>
</tr>
<tr>
<td>Rubber</td>
<td></td>
</tr>
<tr>
<td>Respirator</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>MECHANICAL (GENERAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self contained breathing apparatus</td>
</tr>
</tbody>
</table>

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

<table>
<thead>
<tr>
<th>SIGNATURE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>234-4608B</td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
03-234-5108
2,5-Diaminochlorobenzene Dihydrochloride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
3 chloro-4 aminoaniline dihydrochloride

CHEMICAL NAME AND SYNONYMS
2,5 diaminochloro-benzene dihydrochloride

FORMULA
C₆H₃Cl(NH₂)₂·2 HCl

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
APPROXIMATE OR MAXIMUM % WT. OR VOL.
ESTABLISHED OSHA STANDARD
LD₅₀
LC₅₀ ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW - 215.51

BOILING POINT ¹F. VAPOR PRESSURE C mm Hg.
MELTING POINT ⁰F. VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H₂O = 1) EVAPORATION RATE (________ = 1)
SOLUBILITY IN WATER Pts/100 pts H₂O VOLATILE % Vol. % Wt.
Soluble

APPEARANCE AND ODOR Crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available

METHOD USED

EXTINGUISHING MEDIA
Dry chemical, carbon dioxide, alcohol foam.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322 (3 10-74) 234-5108A
PRODUCT DESIGNATION
2,5 Diaminochlorobenzene Dihydrochloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION Yes

RELEVANT SYMPTOMS OF EXPOSURE
Headache, drowsiness, cyanosis, skin & eye irritant.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, allergic bronchial asthma.

EMERGENCY AND FIRST AID PROCEDURES
Wash skin with soap & water, flush eyes with water;
if swallowed wash mouth, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
Safety goggles
Gloves
Butyl Rubber
Respirator
Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

234-5108B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

TRADE NAME AND SYNONYMS
P,P, Methyleneedianiline

CHEMICAL NAME AND SYNONYMS
P,P-Diaminodiphenylmethane

FORMULA
(H₂N₆₆₄)₂CH₂

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
RÅC MATERIAL LD₅₀ mg/kg IC₅₀
OR MAXIMUM OSHA STANDARD CONC.
% WT. OR VOL. ORAL PERCUT. SPECIES

Note: Lowest published toxic concentration
in air - inhalation - human 169 mg/kg.

Lowest published toxic dose
Oral - man 8.42 mg/kg

SECTION III PHYSICAL DATA

BOILING POINT 399° C. 0°F. VAPOR PRESSURE 253 mm Hg.

FREEzing POINT 93° C. 0°F. VAPOR DENSITY (Air = 1) 15

SPECIFIC GRAVITY (H₂O = 1) EVAPORATION RATE ( ) = 1

SOLUBILITY IN WATER Pts/100 pts H₂O VOLATILE % Vol. % Wt.
Slightly soluble

APPEARANCE AND ODOR
Tan flakes, faint amine-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 440° F.

METHOD USED

EXTINGUISHING MEDIA
Carbon dioxide, dry chemical, alcohol foam.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
P,P-Diaminodiphenylmethane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Mucous membrane and skin irritation, cyanosis and jaundice, digestive tract irritation.

EFFECTS OF CHRONIC EXPOSURE
Liver damage, malignant tumors.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS
When heated to decomposition emits toxic aniline fumes.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

234-6108B
MATERIAL SAFETY DATA SHEET

PRODUCT DESIGNATION
03-234-7108
2,4-Diamino Toluene

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
m-Toluenediamine

CHEMICAL NAME AND SYNONYMS
2,4-Diaminotoluene

FORMULA
CH₃C₆H₃(NH₂)

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
LD₅₀ = oral - human 50 mg/kg

APPROXIMATE ESTABLISHED LD₅₀ OR MAXIMUM ORAL PERCU.
ESTABLISHED OSHA STANDARD

LOWER UPPER

LD₅₀ = oral - rat 500 mg/kg

LD₅₀ = oral - human 50 mg/kg

LD₅₀ = oral - rat 500 mg/kg

LD₅₀ = oral - human 50 mg/kg

SECTION III PHYSICAL DATA

MW = 122.19

BOILING POINT
292°C.

MELTING POINT
99°C.

SPECIFIC GRAVITY (H₂O = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

APPEARANCE AND ODOR
Leaflets

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
None available

METHOD USED

EXTINGUISHING MEDIA
Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
2,4-Diamino-Toluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, inhalation, skin

SKIN AND EYE CARCINOGENIC Yes
IRRITATION Yes

RELEVANT SYMPTOMS OF EXPOSURE
Fatty degeneration of liver, diarrhea, vomiting, cyanosis, methemoglobinemia.

EFFECTS OF CHRONIC EXPOSURE
Sensitizes, methemoglobinemia, cancer.

EMERGENCY AND FIRST AID PROCEDURES
Wash skin & eyes; if swallowed - induce vomiting, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL

RESPIRATOR Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Protect against physical damage to container; store in cool, dry area.

OTHER PRECAUTIONS

SIGNATURE

DATE

234-7108B
PRODUCT DESIGNATION
03-234-7308
2,4 - Diamino Toluene
Monohydrochloride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS 2,4-Diaminotoluene
Monohydrochloride

FORMULA CH₃C₆H₃(NH₂) H Cl

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
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SECTION III PHYSICAL DATA

MW = 158.65

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
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</table>

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<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
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</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE</th>
<th>(_________ = 11)</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
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</table>

APPEARANCE AND ODOR

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

FLAMMABLE (EXPLOSIVE) LIMITS

<table>
<thead>
<tr>
<th>UPPER</th>
<th>LOWER</th>
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</table>

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74) 234-7308A
SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC Yes

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE Fatty degeneration of liver, diarrhea, vomiting, cyanosis, methemoglobinemia.

EFFECTS OF CHRONIC EXPOSURE
Sensitizes, methemoglobinemia, cancer.

EMERGENCY AND FIRST AID PROCEDURES Wash skin & eyes; if swallowed - induce vomiting, get medical aid

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL RESPIRATOR Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

234-7308B
### SECTION I   SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dipentylamine</td>
<td>( (C_{5}\text{,}<em>{11})</em>\text{NH} )</td>
</tr>
</tbody>
</table>

### SECTION II   HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) mg/kg</th>
<th>LC(_{50}) SPECIES CONC.</th>
</tr>
</thead>
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</tbody>
</table>

**Note:** Lowest published lethal concentration in air

- Inhalation - rat, 62 PPM / 4 hours
- Lowest published lethal dose 35 mg/kg
- Skin - rabbit

### SECTION III   PHYSICAL DATA

| MW | 157.26 |

<table>
<thead>
<tr>
<th>Boiling Point</th>
<th>°F.</th>
<th>Vapor Pressure mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>202 °F</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Melting Point</th>
<th>°F.</th>
<th>Vapor Density (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>5.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Gravity ( (H_2O = 1) )</th>
<th>0.777</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Solubility in Water Pts/100 pts ( H_2O )</th>
<th>Very slightly soluble</th>
</tr>
</thead>
</table>

**Appearance and Odor**

Water white liquid, ammonical odor

### SECTION IV   FIRE AND EXPLOSION HAZARD DATA

**Flash Point**

- 124 °F

<table>
<thead>
<tr>
<th>Method Used</th>
<th>Flammable (Explosive) Limits</th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed Cup</td>
<td></td>
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</tr>
</tbody>
</table>

**Extinguishing Media**

Alcohol foam, carbon dioxide, dry chemical

**Special Fire Fighting Procedures**

**Unusual Fire and Explosion Hazards**
PRODUCT DESIGNATION
Di-N-Amylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes and respiratory system, severe irritation of digestive tract.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - drink water, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Put sodium bisulfate on spills, wash with water.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles
MECHANICAL (GENERAL)
GLOVES
SPECIAL
Rubber
RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
Wear full protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Protect against physical damage; store in cool, well-ventilated place.

OTHER PRECAUTIONS

SIGNATURE

DATE

234-7608B
PRODUCT DESIGNATION
03-234-8108
0-Dianisidine

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

CHEMICAL FAMILY

FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 mg/kg

LC50

ORAL PERCUT. SPECIES CONC.

Lower published toxic concentration in air inhalation - human 1.9 mg/kg.

SECTION III PHYSICAL DATA

MW - 244.28

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

°F.

VAPOR DENSITY (AIR = 1)

SPECIFIC GRAVITY (H2O = 1)

EVAPORATION RATE ( mm Hg = 1)

SOLUBILITY IN WATER Pts/100 pts H2O

VOLATILE % Vol.

% Wt.

Insoluble

APPEARANCE AND ODOR

Colorless crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

not available

METHOD Used

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical, water spray

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

Emits toxic fumes when heated to decomposition point.
PRODUCT DESIGNATION
O-Dianisidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

CARCINOGENIC Neoplastic

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, skin, ingestion

SKIN AND EYE IRRITATION yes

RELEVANT SYMPTOMS OF EXPOSURE
Headache, drowsiness, cyanosis

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Wash skin with soap and water; if swallowed - give emetic, get medical aid, inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

234-8108B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

1,3 Diphenyl Triazine

FORMULA

C₆H₅NHNNC₆H₅

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
L₅₀ M₅₀ LC₅₀

BASIC MATERIAL OR MAXIMUM OSHA STANDARD

LD₅₀ Mg/kg LC₅₀

ORAL PERCUT. SPECIES CONC.

224 Ret

SECTION III PHYSICAL DATA

MW - 197.26

BOILING POINT

VAPOR PRESSURE

mm Hg.

MELTING POINT

98°C.

°C.

VAPOR DENSITY (Air = 1)

6.8

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE

SPECIES CONC.

SOLUBILITY IN WATER

Insoluble

Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Small, golden-yellow crystals.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

EXTINGUISHING MEDIA

Explosive do not fight fire except by remote control.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARD

Explores when heated to 150°C.
PRODUCT DESIGNATION
Diazoaminobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
Yes

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, inhalation of dust, skin

SKIN AND EYE
IRRITATION
Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes and skin.

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage, tumors.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Dust mask

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

234-9108B
PRODUCT DESIGNATION
1,2,5,6 Dibenzanthracene
03-235-0709

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Dibenz(a,h)anthracene

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD_{50}

ORAL PERCUT. SPECIES CONC.

LC_{50}

Lowest published toxic dose
subcutaneous - rat 0.5 mg/kg.

Lowest published toxic dose
oral - mouse - 0.36 mg/kg

Lowest published lethal dose
skin - mouse - 0.6 micrograms per kg.

SECTION III PHYSICAL DATA

MW - 278.33

BOILING POINT

sublimes

VAPOR PRESSURE

mm Hg.

0 F.

VAPOR DENSITY (Air = 1)

MELTING POINT

262°C

SPECIFIC GRAVITY (H_{2}O = 1)

EVAPORATION RATE ( = 1)

SOLUBILITY IN WATER

Pts/100 pts H_{2}O

Slightly soluble

APPEARANCE AND ODOR

Crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

not available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Gastroenteric distress, tremors, convulsions, fever, dermatitis

EFFECTS OF CHRONIC EXPOSURE
Tumors, cancer, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)
GLOVES

SPECIAL
RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

235-0709B
## SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dibenzothiophene</td>
<td>C_{6}H_{4}SC_{6}H_{4}</td>
</tr>
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</table>

## SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50}</th>
<th>LC_{50}</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**None available**

## SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>333° C.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100° C.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H_{2}O = 1)</th>
<th>EVAPORATION RATE (------= 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H_{2}O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wr.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### APPEARANCE AND ODOR

## SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>UPPER</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>LOWER</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide, dry chemical.</td>
</tr>
</tbody>
</table>

### SPECIAL FIRE FIGHTING PROCEDURES

### UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Dibenzothiophene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELANT SYMPTOMS OF EXPOSURE
Corrosive action on mouth and digestive system, bloody saliva flow, dizziness, rapid heart action, shortness of breath.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - oxygen as needed; if swallowed - induce vomiting, get medical aid; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT SPECIFY TYPES)

EYE Goggles

GLOVES

RUBBER

RESPIRATOR

SPECIAL

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

235-1209B
**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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</thead>
<tbody>
<tr>
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<td></td>
</tr>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 dibromobenzene</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Br₂C₆H₄</td>
</tr>
</tbody>
</table>

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>available</td>
<td></td>
<td></td>
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</table>

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW = 235.92</th>
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<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F</th>
<th>VAPOR PRESSURE at 61°C</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>219°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F</th>
<th>VAPOR DENSITY (Air = 1)</th>
<th>8.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>87°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.26</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear crystal, odor of xylene</td>
</tr>
</tbody>
</table>

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
</table>

Use water spray, foam, carbon dioxide or dry chemical

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
</table>

Wear self contained breathing apparatus.

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
</table>

UCN-11322
(3 10-74)
**PRODUCT DESIGNATION**

P-dibromobenzene

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>NO</td>
</tr>
</tbody>
</table>

**PRINCIPLE ROUTES OF ABSORPTION**

Inhalation, ingestion, skin

**SKIN AND EYE IRRITATION**

Severe

**RELEVANT SYMPTOMS OF EXPOSURE**

Cyanosis, deep & rapid respiration, irregular pulse, drowsiness, unconsciousness

**EFFECTS OF CHRONIC EXPOSURE**

Lung, liver & kidney damage

**EMERGENCY AND FIRST AID PROCEDURES**

Inhalation - rest; if swallowed - give emetic, get medical aid; wash from skin & eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

**WARNING OF DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS</th>
<th>LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Goggles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gloves Polyvinyl alcohol Self contained</td>
</tr>
</tbody>
</table>

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

235-4209B
PRODUCT DESIGNATION
03-235-4709
4,6 - Dibromo-O-Cresol

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER’S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
3,5 dibromo-2 hydroxytoluene

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50

LC50

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW - 265.95

BOILING POINT °F.

VAPOR PRESSURE mm Hg.

decomposes at 265°C

MELTING POINT °F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1)

EVAPORATION RATE 1

SOLUBILITY IN WATER Pts/100 pts H2O

VOLATILE % Vol., % Wt.

very slightly soluble

APPEARANCE AND ODOR

crystal with phenolic odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available

METHOD USED

EXTINGUISHING MEDIA

Water spray, dry chemical, foam or carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74) 235-4709A
PRODUCT DESIGNATION
4,6 Dibromo-O-Cresol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
NO

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, vomiting, nausea, sweating, intense thirst, diarrhea, convulsions, collapse.

EFFECTS OF CHRONIC EXPOSURE
Liver or kidney damage, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, if swallowed - give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

235-4709B
MATERIAL SAFETY DATA SHEET

SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

P, P-Dibromobiphenyl

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD$_{50}$

LC$_{50}$

ORAL PERCUT. SPECIES CONC.

None available

SECTION III  PHYSICAL DATA

MW - 312.02

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

357°C

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

166°C

SPECIFIC GRAVITY (H$_2$O = 1)

1.90

EVAPORATION RATE ( )

SPECIES

CONC.

VOLATILE

% Vol.

% Wt.

Insoluble

APPEARANCE AND ODOR

Crystal

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

METHOD USED

EXTINGUISHING MEDIA

Water, foam, carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

235-5209A

(3 10-74)
PRODUCT DESIGNATION
4,4-Dibromobiphenyl

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

TUMOLOGIC LEVEL
Carcinogenic No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Acne, irritation of respiratory passages

EFFECTS OF CHRONIC EXPOSURE
Liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, get medical aid; if swallowed -
wash mouth, give emetic, get medical aid, wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL RESPIRATOR

RESPIRATOR With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

235-5209B
**PRODUCT DESIGNATION**
03-235-7209
2,6-Dibromo-4 Nitrophenol

---

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,0' Dibromo-P Nitrophenol</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{Br}_2 \text{C}_6 \text{H}_2 (\text{OH}) \text{NO}_2 )</td>
</tr>
</tbody>
</table>

---

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50})</th>
<th>LC(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>None available</th>
</tr>
</thead>
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---

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>0(^\circ) F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{d} &gt; 145^\circ\text{C} )</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>0(^\circ) F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( 143^\circ\text{C} )</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (( \text{H}_2\text{O} = 1 ))</th>
<th>0 F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{EVAPORATION RATE (} \text{H}_2\text{O} = 1 )</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>0 F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{Vol}/100 \text{ pts} \text{ H}_2\text{O} )</td>
<td></td>
</tr>
<tr>
<td>very soluble</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
<th>0 F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>colorless crystals</td>
<td></td>
</tr>
</tbody>
</table>

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**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>None available</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water, dry chemical, carbon dioxide, alcohol foam</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear self-contained gas mask</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
2,6-Dibromo-4-Nitrophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE CARCINOGENIC Ingestion, skin

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Cyanosis, deep & rapid respiration, irregular pulse, severe damage to digestive tract, drowsiness.

EFFECTS OF CHRONIC EXPOSURE Lung, liver & kidney damage.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest; if swallowed - drink water, epsom salts, get medical aid; wash from eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
Decomposes on heating to give toxic bromides.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

Rubber

RESPIRATOR

Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

235-7209B
### PRODUCT DESIGNATION

03-235-7709  
2,4-Dibromophenol

---

### MATERIAL SAFETY DATA SHEET

---

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNonyms</th>
<th>CHEMICAL NAME AND SYNonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-Dibromophenol</td>
<td>2,4-Dibromophenol</td>
</tr>
</tbody>
</table>

### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>None available</td>
</tr>
</tbody>
</table>

### SECTION III  PHYSICAL DATA

| MW | 251.92 |

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>239°C.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40°C.</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H2O = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVAPORATION RATE (_________ = 1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H2O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**APPEARANCE AND ODOR**

Crystalline

---

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>Flammable (Explosive) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>UPPER</td>
</tr>
<tr>
<td></td>
<td>LOWER</td>
</tr>
</tbody>
</table>

**EXTINGUISHING MEDIA**

Dry chemical, alcohol foam, carbon dioxide.

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

---

UCN-11322  
(3 10-74)  
235-7709A
PRODUCT DESIGNATION
2,4 Ditromophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin & mucous membrane irritation dermatitis; cyanosis.

EFFECTS OF CHRONIC EXPOSURE
Liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; wash from skin & eyes; if swallowed - give emetic, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Pour sand to soda ash (9:1) mixture on spill and sweep into box for disposal.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
BUTYL RUBBER

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry place.

OTHER PRECAUTIONS

SIGNATURE

DATE

235-7709B
## PRODUCT DESIGNATION
03-235-7749
2,6 - Dibromophenol

## MATERIAL SAFETY DATA SHEET

### SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER’S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,6 Dibromophenol</td>
<td>( \text{Br}_2\text{C}_6\text{H}_3\text{OH} )</td>
</tr>
</tbody>
</table>

### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>( \text{LD}_{50} )</th>
<th>( \text{LC}_{50} )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td>None available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION III  PHYSICAL DATA

- **MW**: 251.92
- **Boiling Point**: 56°C
- **Melting Point**: 56°C
- **Specific Gravity**: 1
- **Solubility in Water**: Pls/100 pts \( \text{H}_2\text{O} \)
- **Appearance and Odor**: Needle-like crystals

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

- **Flash Point**: None available
- **Method Used**: Dry chemical, alcohol foam, carbon dioxide.

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
2,6-Dibromophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE

Eye, skin and mucous membrane irritation, dermatitis, cyanosis.

EFFECTS OF CHRONIC EXPOSURE

Liver damage

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; wash skin & eyes; if swallowed - give emetic, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Pour sand to soda ash (9:1) mixture on spill and sweep into box for disposal.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

Protective clothing

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

GLOVES

Butyl Rubber

RESPIRATOR

Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry place.

OTHER PRECAUTIONS

SIGNATURE

DATE

235-7749B
## PRODUCT DESIGNATION

03-235-8709
3,5 Dibromopyridine

## MATERIAL SAFETY DATA SHEET

### SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,5 Dibromopyridine</td>
<td>C₅H₃NBr₂</td>
</tr>
</tbody>
</table>

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td></td>
<td>none available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>MW</th>
<th>236.91</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>222°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>111°C</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER Pts/100 pts H₂O</th>
<th>VOLATILE % Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slightly soluble</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
<th>Solid - fish-like odor.</th>
</tr>
</thead>
</table>

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>none available</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>Alcohol foam, carbon dioxide, dry chemical</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th>none available</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus

### UNUSUAL FIRE AND EXPLOSION HAZARDS
**PRODUCT DESIGNATION**
3,5 dibromopyridine

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**
- Not available

**CARCINOGENIC**
- No

**RELEVANT SYMPTOMS OF EXPOSURE**
- Narcosis, headache, nausea, giddiness, vomiting

**EFFECTS OF CHRONIC EXPOSURE**
- Occasional vomiting and diarrhea; weight loss and anemia, ocular and facial paralysis.

**EMERGENCY AND FIRST AID PROCEDURES**
- Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash skin & eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATABILITY (MATERIALS TO AVOID)**
- May react with oxidizing materials

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**
- Use in hood

**MECHANICAL (GENERAL)**
- Goggles

**SPECIAL**
- Rubber

**OTHER PROTECTIVE EQUIPMENT**
- Self-contained

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

235-8709B
# Material Safety Data Sheet

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,5-Dibromotoluene</td>
<td>Br₂C₆H₃CH₃</td>
</tr>
</tbody>
</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Vol.</th>
<th>Species</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
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</tr>
</tbody>
</table>

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Boiling Point</th>
<th>°F.</th>
<th>Vapour Pressure (mm Hg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>236°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Melting Point</th>
<th>°F.</th>
<th>Vapour Density (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤-20°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Gravity (H₂O = 1)</th>
<th>Evaporation Rate (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.81</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solubility in Water</th>
<th>Volatile</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Appearance and Odor**

- Colorless liquid

## Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Flash Point</th>
<th>Flammable (Explosive) Limits</th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extinguishing Media</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol foam, carbon dioxide, dry chemical</td>
<td></td>
</tr>
</tbody>
</table>

### Special Fire Fighting Procedures

- |

### Unusual Fire and Explosion Hazards

- |
### PRODUCT DESIGNATION
2,5 dibromotoluene

### SECTION V HEALTH HAZARD DATA

#### TOXIC LEVEL
None available

#### PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

#### RELEVANT SYMPTOMS OF EXPOSURE
Eye & respiratory system irritation, severe internal irritation of digestive tract.

#### EFFECTS OF CHRONIC EXPOSURE

#### EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

### SECTION VI REACTIVITY DATA

#### CONDITIONS CONTRIBUTING TO INSTABILITY

#### CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

#### INCOMPATIBILITY (MATERIALS TO AVOID)

#### HAZARDOUS DECOMPOSITION PRODUCTS

### SECTION VII SPILL OR LEAK PROCEDURES

#### STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

### SECTION VIII SPECIAL PROTECTION INFORMATION

#### VENTILATION REQUIREMENTS LOCAL EXHAUST

#### MECHANICAL (GENERAL)

#### SPECIAL

#### OTHER PROTECTIVE EQUIPMENT

#### PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles
GLOVES
RESPIRATOR
With proper filter

### SECTION IX SPECIAL PRECAUTIONS

#### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

### OTHER PRECAUTIONS

### SIGNATURE

### DATE

235-9209B
PRODUCT DESIGNATION
03-236-0300
Diisobutyl Amine

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
1-amino-2-methylpropane

FORMULA
(CH₃)₂CHCH₂NH₂

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ (mg/kg)</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>258</td>
<td></td>
<td>Rat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>629</td>
<td></td>
<td>Mouse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>620</td>
<td></td>
<td>Guinea Pig</td>
<td></td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

MW-129.24

<table>
<thead>
<tr>
<th></th>
<th>BOILING POINT</th>
<th>VAPOR PRESSURE</th>
<th>SPECIFIC GRAVITY</th>
<th>SOLUBILITY IN WATER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>140°C</td>
<td>At 31°C.</td>
<td>(H₂O = 1)</td>
<td>Pts/100 pts H₂O</td>
</tr>
<tr>
<td></td>
<td>-70°F</td>
<td>VAPOR DENSITY (Air = 1)</td>
<td>0.75</td>
<td>% Vol.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EVAPORATION RATE</td>
<td></td>
<td>% Wt.</td>
</tr>
</tbody>
</table>

|                   | 10 mm Hg.     | 4.46           | VOLATILE         |                   |

APPEARANCE AND ODOR
Water-white amine-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th></th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLASH POINT</td>
<td>UPPPER</td>
</tr>
<tr>
<td>85°F.</td>
<td>LOWER</td>
</tr>
</tbody>
</table>

| METHOD USED    | Foam, carbon dioxide, dry chemical. |

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear goggles and self-contained breathing apparatus,</td>
<td></td>
</tr>
</tbody>
</table>

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)
PRODUNIT DESIGNATION
Diisobutyl Amine

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE
Stimulation of sympathetic nervous system, cardiac depressant, may cause convulsions.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - drink water, get medical aid; wash skin and eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY  (MATERIALS TO AVOID)
May react vigorously with oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

ULOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE  

DATE

236-0300B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Di-N-butylamine

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
BASIC MATERIAL OR MAXIMUM OSFA STANDARD LD50 mg/kg LC50
% WT. OR VOL. STANDARD SPECIES CONC.

LC50 - inhalation - rat 500 ppm/4 HR.

360

Rat

1010

Rabbit

SECTION III PHYSICAL DATA

MW-129.28

BOILING POINT 159°C 159°F

VAPOR PRESSURE at 20°C 2 mm Hg

MELTING POINT -62°C -62°F

VAPOR DENSITY (Air = 1) 4.46

SPECIFIC GRAVITY (H2O = 1) EVAPORATION RATE ( = 1)

0.76

0.76

SOLUBILITY IN WATER Pts/100 pts H2O VOLATILE % Vol. % Wt.

very soluble

APPEARANCE AND ODOR liquid colorless

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 125°F

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

METHOD USED OC

EXTINGUISHING MEDIA Alcohol foam, dry chemical or carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES Wear goggles and self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)
PRODUCT DESIGNATION
N Dibutylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Restlessness, excitability, increased pulse and respiratory rates; irritates eye, skin and digestive system

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - drink water, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

Rubber RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

236-0400B
## PRODUCT DESIGNATION
03-236-0500
Di-Sec Butylamine

## SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
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<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade Name and Synonyms</td>
<td>Chemical Family</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Di-Sec Butylamine</td>
<td>(C₄H₉)₂NH</td>
</tr>
</tbody>
</table>

## SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ ORAL</th>
<th>LC₅₀ PERCU.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

None available

## SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>132°C. O°F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MELTING POINT</td>
<td>-104°C. O°F.</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY</td>
<td>(H₂O = 1) 0.78</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H₂O Very soluble</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

MW = 12.92

<table>
<thead>
<tr>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAPOR DENSITY (Air = 1)</td>
<td>4.5</td>
</tr>
<tr>
<td>EVAPORATION RATE (Air = 1)</td>
<td></td>
</tr>
<tr>
<td>VOLATILE</td>
<td>% Vol.</td>
</tr>
<tr>
<td>% WT.</td>
<td></td>
</tr>
</tbody>
</table>

## SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>75°F.</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHOD USED</td>
<td>O.C.</td>
</tr>
<tr>
<td>EXTINGUISHING MEDIA</td>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FLAMMABLE EXPLOSIVE LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPPER</td>
</tr>
<tr>
<td>LOWER</td>
</tr>
</tbody>
</table>

UNUSUAL FIRE AND EXPLOSION HAZARDS
**PRODUCT DESIGNATION**
Disecbutylamine

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRINCIPLE ROUTES OF ABSORPTION</th>
<th>SKIN AND EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation, ingestion</td>
<td>IRRITATION Severe</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RELEVANT SYMPTOMS OF EXPOSURE</th>
<th>EFFECTS OF CHRONIC EXPOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restlessness, excitability, increased pulse and respiration rates, irritates eyes, skin and digestive systems.</td>
<td></td>
</tr>
</tbody>
</table>

**SECTION VI REACTIVITY DATA**

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO INSTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INCOMPATABILITY (MATERIALS TO AVOID)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HAZARDOUS DECOMPOSITION PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SECTION VII SPILL OR LEAK PROCEDURES**

<table>
<thead>
<tr>
<th>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Goggles</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MECHANICAL (GENERAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLOVES</td>
</tr>
<tr>
<td>Rubber</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESPIRATOR</td>
</tr>
<tr>
<td>Self-contained</td>
</tr>
</tbody>
</table>

**SECTION IX SPECIAL PRECAUTIONS**

<table>
<thead>
<tr>
<th>PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER PRECAUTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SIGNATURE**

DATE

236-0500B
PRODUCT DESIGNATION
03-236-0800
Di-N-Butylaniline

MATERIAL SAFETY DATA SHEET

SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
N N'-Dibutylaniline

FORMULA
C_6H_5N(C_4H_9)_2

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD_{50}

LC_{50}

ORAL PERCUT. SPECIES CONC.

none available

SECTION III  PHYSICAL DATA

MW - 205.34

BOILING POINT
263°C

VAPOR PRESSURE
mm Hg.

MELTING POINT

VAPOR DENSITY (Air = 1)
7.1

SPECIFIC GRAVITY (H2O = 1)
0.94

EVAPORATION RATE (_______ = 1)

SOLUBILITY IN WATER Pts/100 pts H2O
Insoluble

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR
Light yellow liquid

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
230°F

FLAMMABLE (EXPLOSIVE) LIMITS

METHOD USED

UPPER

EXTINGUISHING MEDIA
Water, alcohol foam, carbon dioxide, dry chemical

LOWER

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Di-N Butylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Headache, drowsiness, cyanosis, mental confusion, convulsions

EFFECTS OF CHRONIC EXPOSURE
Fatigue, loss of appetite, headache, dizziness

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid; inhalation - rest, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Polyvinyl alcohol gloves

SPECIAL

OTHER PROTECTIVE EQUIPMENT

SELF-CONTAINED

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

236-0800B
MATERIAL SAFETY DATA SHEET

SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

di-n-butyl mercury

FORMULA

Hg(C₆H₅)₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.

LOWEST PUBLISHED DEADLY DOSE

See Note

INTRAPERITONEAL - RAT 8 mg/kg

SECTION III PHYSICAL DATA

MW = 314.83

BOILING POINT

°F.

123°C at 23 mm

VAPOR PRESSURE

mm Hg.

at 105°C

10

MELTING POINT

°F.

SPECIFIC GRAVITY (H₂O = 1)

—

10.8

SPECIFIC GRAVITY IN WATER

1.80

SOLUBILITY IN WATER

Pts/100 pts H₂O

Insoluble

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

not available

METHOD USED

EXTINGUISHING MEDIA

Water, carbon dioxide, alcohol foam

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition point, emits toxic fumes of mercury.
PRODUCT DESIGNATION
Di-N-Butyl Mercury

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
0.001 PPM, 0.01 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
ingestion, skin, inhalation

SKIN AND EYE
IRRITATION slight

RELEVANT SYMPTOMS OF EXPOSURE
Severe gastroenteric distress; dermatitis, decolonization of nails, ulcerization of mucous membranes and eyes.

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage; nerve disorders, psychic disturbances, loosening of teeth.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - antidote, dimercaprol, get medical aid; inhalation - rest; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

236-4300B
# Material Safety Data Sheet

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacture's Name</th>
<th>Emergency Telephone No.</th>
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</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dichloroacetyl Chloride</td>
<td>Dichloroethanoyl Chloride</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Forml.</th>
<th>Chemical Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cl₂CHOCCL</td>
<td></td>
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</table>

## Section II: Hazardous Ingredients

### Basic Material

<table>
<thead>
<tr>
<th>Substance</th>
<th>Approximate or Maximum % WT. or VOL.</th>
<th>Established OSHA Standard</th>
<th>L&lt;sub&gt;D50&lt;/sub&gt; mg/kg</th>
<th>LC&lt;sub&gt;50&lt;/sub&gt; SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCLO inh-rat</td>
<td>2000 ppm/4H</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Hazardous Ingredients

<table>
<thead>
<tr>
<th>Species</th>
<th>LC&lt;sub&gt;50&lt;/sub&gt; Rat</th>
<th>LC&lt;sub&gt;50&lt;/sub&gt; Rabbit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td>2460</td>
<td>650</td>
</tr>
<tr>
<td>Rabbit</td>
<td></td>
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## Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>MW</td>
<td>147.4</td>
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</tbody>
</table>

### Boiling Point

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Units</th>
<th>Vapor Pressure mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>108°C</td>
<td>°C</td>
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</tbody>
</table>

### Melting Point

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Units</th>
<th>Vapor Density (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>°F</td>
<td>5.1</td>
</tr>
</tbody>
</table>

### Specific Gravity

<table>
<thead>
<tr>
<th>Relative to Water</th>
<th>1.53</th>
</tr>
</thead>
</table>

### Solubility in Water

<table>
<thead>
<tr>
<th>Solubility in Pts/100 pts H&lt;sub&gt;2&lt;/sub&gt;O</th>
<th>Volatile</th>
</tr>
</thead>
<tbody>
<tr>
<td>reacts with water</td>
<td>% Vol.</td>
</tr>
</tbody>
</table>

### Appearance and Odor

- Clear liquid, acrid odor

## Section IV: Fire and Explosion Hazard Data

### Flash Point

- 151°

### Method Used

- Do not use water or foam, use carbon dioxide or dry chemical.

### Extinguishing Media

- Special Fire Fighting Procedures

### Unusual Fire and Explosion Hazards

- When heated to decomposition point, gives off toxic chloride fumes
PRODUCT DESIGNATION
Dichloroacetyl chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes and respiratory system; severe internal damage if swallowed; eye & skin burns.

EFFECTS OF CHRONIC EXPOSURE
Bronchial irritation, erosion of teeth.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, get medical aid; if swallowed - drink water, milk of magnesia, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
Reacts with water to produce H Cl, alcohol and dimethyl sulfoxide.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT
Rubber apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

236-5800B
MATERIAL SAFETY DATA SHEET

SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2,4-Dichlorobenzaldehyde

FORMULA

C₇H₄Cl₂O

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ ORAL PERCUT. SPECIES CONC

LC₅₀

none available

SECTION III  PHYSICAL DATA

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (________ = 1)

SOLUBILITY IN WATER

Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

Insoluble

APPEARANCE AND ODOR

White crystal

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

METHOD USED

FLAMMABLE (EXPLOSIVF) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

236-7300A
PRODUCT DESIGNATION
2,4 Dichlorobenzaldehyde

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic no

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, skin, inhalation

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Eye irritation, headache, drowsiness, gastroenteric distress, pulmonary edema

EFFECTS OF CHRONIC EXPOSURE
Anemia, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid; wash skin & eyes; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

236-7300B
PRODUCT DESIGNATION
03-236-7800
M-dichlorobenzene

MATERIAL SAFETY
DATA SHEET

SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

M-dichlorobenzene

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED
OSHA
STANDARD

LD50

LC50

ORAL PERCUt. SPECIES CONC.

none available

SECTION III  PHYSICAL DATA

BOILING POINT

173°C 0°F.

VAPOR PRESSURE

at 12.1°C

1 mm Hg.

MELTING POINT

24.8°C 0°F.

VAPOR DENSITY (Air = 1)

5.08

SPECIFIC GRAVITY (H2O = 1)

1.288

EVAPORATION RATE ( 

SOLUBILITY IN WATER Pts/100 pts H2O

Insoluble

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

METHOD USED

EXTINGUISHING MEDIA

Water spray, foam, CO2 or dry chemical

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

236-7800A
**PRODUCT DESIGNATION**
M-dichlorobenzene

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRINCIPLE ROUTES OF ABSORPTION</th>
<th>SKIN AND EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation, ingestion</td>
<td>IRRITATION</td>
</tr>
<tr>
<td></td>
<td>severe</td>
</tr>
</tbody>
</table>

| RELEVANT SYMPTOMS OF EXPOSURE | Eye, skin and mucous membrane irritation, headache; drowsiness, unsteadiness |

| EFFECTS OF CHRONIC EXPOSURE | Liver damage |

<table>
<thead>
<tr>
<th>EMERGENCY AND FIRST AID PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation - rest, keep warm; if swallowed - wash mouth, give emetic, get medical attention; wash from skin &amp; eyes.</td>
</tr>
</tbody>
</table>

**SECTION VI REACTIVITY DATA**

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO INSTABILITY</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>INCOMPATABILITY (MATERIALS TO AVOID)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>HAZARDOUS DECOMPOSITION PRODUCTS</th>
</tr>
</thead>
</table>

**SECTION VII SPILL OR LEAK PROCEDURES**

<table>
<thead>
<tr>
<th>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED</th>
</tr>
</thead>
</table>

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical (general)</td>
<td>Eye</td>
</tr>
<tr>
<td></td>
<td>Goggles</td>
</tr>
<tr>
<td></td>
<td>Rubber</td>
</tr>
<tr>
<td></td>
<td>Self-contained breathing apparatus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER PROTECTIVE EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective clothing</td>
</tr>
</tbody>
</table>

**SECTION IX SPECIAL PRECAUTIONS**

<table>
<thead>
<tr>
<th>PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Store in well-ventilated, dark, cool area.</td>
</tr>
</tbody>
</table>

**WASTE DISPOSAL METHOD**

**SIGNATURE**

**DATE**

236-7800B
# Material Safety Data Sheet

**PRODUCT DESIGNATION**

o-Dichlorobenzene  
03-236-7850

**SECTION I: SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS**

0-Dichlorobenzene

**SECTION II: HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50 mg/kg</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 - 500 mg/kg oral - Human</td>
<td></td>
<td></td>
<td>500</td>
<td>Rat</td>
</tr>
<tr>
<td>LC50 - 821 PPM/7H. inh-rat</td>
<td></td>
<td></td>
<td>500</td>
<td>Rabbit</td>
</tr>
</tbody>
</table>

**SECTION III: PHYSICAL DATA**

<table>
<thead>
<tr>
<th>Prop</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>180°C.</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-2°C.</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1)</td>
<td>1.30</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
</tbody>
</table>

**Appearance and Odor**

Colorless liquid pleasant aromatic odor.

**SECTION IV: FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>151°F</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Water may be used to blanket fire, water spray, foam, CO2 or dry chemical</td>
</tr>
</tbody>
</table>

**SPECIAL FIRE FIGHTING PROCEDURES**

Wear self-contained breathing apparatus.
PRODUCT DESIGNATION
o-Dichlorobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 50 ppm or 300 mg/m³ (ceiling value)

Carcinogenic No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation (mainly)

SKIN AND EYE IRRITATION Liquid - severe!

RELEVANT SYMPTOMS OF EXPOSURE
Drowsiness, unsteadiness, eye irritation, difficulty in breathing, eye and skin damage, kidney and liver damage.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, keep warm, if swallowed - wash mouth, give emetic, get medical attention; wash from eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Aluminum, sodium and potassium.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
Consult Industrial Hygiene Department

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Side shield safety goggles
GLOVES Impervious neoprene
RESPIRATOR Self-contained breathing apparatus

MECHANICAL (GENERAL)
Consult Industrial Hygiene Department

SPECIAL
Consult Industrial Hygiene Department

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in well-ventilated, dark and cool area in a closed container.

OTHER PRECAUTIONS

SIGNATURE

DATE

236-7850B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀

ORAL PERCUT. SPECIES CONC.

500

2950

Mouse

LD₅₀ 500 mg/kg oral - human

Note: Lowest published toxic dose, oral - human 300 mg/kg

SECTION III PHYSICAL DATA

BOILING POINT 345°F

VAPOR PRESSURE

25°C 1 mm Hg.

MELTING POINT 127°F

VAPOR DENSITY (Air = 1)

5.1

SPECIFIC GRAVITY (H₂O = 1)

1.5

EVAPORATION RATE ( ) = 1

SOLUBILITY IN WATER Pts/100 pts H₂O

Insoluble

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 150°F

METHOD USED Closed Cup

EXTINGUISHING MEDIA

Water may be used to blanket fire; water spray, foam, CO₂, or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A
**PRODUCT DESIGNATION**

p-Dichlorobenzene

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**

TLV 75 ppm, 450 mg/kg

**PRINCIPLE ROUTES OF ABSORPTION**

Inhalation (mainly)

**SKIN AND EYE IRRITATION**

Severe

**RELEVANT SYMPTOMS OF EXPOSURE**

Eye, skin and mucous membrane irritation, headache, stimulation of the central nervous system; lung, kidney and liver damage.

**EFFECTS OF CHRONIC EXPOSURE**

Vertigo, cataract, loss of weight.

**EMERGENCY AND FIRST AID PROCEDURES**

Inhalation - rest, keep warm; if swallowed - wash mouth, give emetic, get medical attention; wash from skin and eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

Aluminum, sodium and potassium.

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

Consult Industrial Hygiene Department

**PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE**

Face shield

**MECHANICAL (GENERAL)**

Consult Industrial Hygiene Department

**GLOVES**

Impervious neoprene

**SPECIAL**

Consult Industrial Hygiene Department

**RESPIRATOR**

Self-contained breathing apparatus

**OTHER PROTECTIVE EQUIPMENT**

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

Store in well ventilated, dark and cool area.

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

236-7900B
PRODUCT DESIGNATION
2,5-Dichloronitrobenzene
03-237-2401

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
1,4 dichloro-2-nitrobenzene

CHEMICAL FORMULA
C12C6H4NO2

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50

LC50

ORAL PERCUT. SPECIES CONC.

1210 Rat

SECTION III PHYSICAL DATA

MW=192.00

BOILING POINT
266°C

VAPOR PRESSURE

mm Hg.

MELTING POINT
55°C

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1)
1.67

EVAPORATION RATE ( ------= 1)

SOLUBILITY IN WATER

Insoluble

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Colorless crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
Not available

METHOD USED

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide, dry chemical

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

SPECIAL FIRE FIGHTING PROCEDURES

Self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS
SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, inhalation of dust

SKIN AND EYE IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin & mucous membrane irritation, headache; drowsiness, unsteadiness.

EFFECTS OF CHRONIC EXPOSURE
Liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; keep warm; if swallowed - wash mouth, give emetic; get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL RESPIRATOR Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

237-2401B
PRODUCT DESIGNATION

03-237-2501
1,2 - dichloro - 4- nitrobenzene

MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

CHEMICAL FORMULA

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM</th>
<th>ESTABLISHED</th>
<th>LD50 mg/kg</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% WT. OR VOL.</td>
<td>OSHA STANDARD</td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>643</td>
<td>Rat</td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

MW - 192.00

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>256°C</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>43°C</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY</td>
<td>1.43</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Insoluble</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLASH POINT</td>
<td>Not available</td>
</tr>
<tr>
<td>METHOD USED</td>
<td></td>
</tr>
</tbody>
</table>

| EXTINGUISHING MEDIA    |                              |
| Water spray, foam, carbon dioxide, dry chemical |

| SPECIAL FIRE FIGHTING PROCEDURES |                              |
| Self-contained breathing apparatus. |                              |

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN 11232
(3 10-74)
**PRODUCT DESIGNATION**

1,2 - dichlor - 4 - nitrobenzene

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>No</td>
</tr>
</tbody>
</table>

**PRINCIPLE ROUTES OF ABSORPTION**

- Ingestion, inhalation of dust

**SKIN AND EYE IRRITATION**

- Severe

**RELEVANT SYMPTOMS OF EXPOSURE**

- Eye, skin & mucous membrane irritation, headache;
- Drowsiness, unsteadiness

**EFFECTS OF CHRONIC EXPOSURE**

- Liver damage

**EMERGENCY AND FIRST AID PROCEDURES**

- Inhalation - rest, keep warm; if swallowed - wash mouth, give emetic, get medical aid; wash from skin & eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATABILITY (MATERIALS TO AVOID)**

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

**MECHANICAL (GENERAL)**

**GOGGLES**

**GLOVES**

**RESPIRATOR**

**Self-contained**

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

237-2501B
# Material Safety Data Sheet

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer’s Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-Dichlorophenol</td>
<td></td>
</tr>
</tbody>
</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % wt. or vol.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest published toxic dose</td>
<td>580</td>
<td>Rat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>skin - mouse, 312 mg/kg - carcinogen</td>
<td>1600</td>
<td>Mouse</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>210°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>45°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.38</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Pts/100 pts H₂O 0.45</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>White crystals</td>
</tr>
<tr>
<td>Flash Point</td>
<td>237°F</td>
</tr>
<tr>
<td>Vapor Pressure at 53°C</td>
<td></td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>5.62</td>
</tr>
<tr>
<td>Evaporation Rate (_________ = 1)</td>
<td></td>
</tr>
<tr>
<td>Solubility Phs/100 Phs H₂O</td>
<td></td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td></td>
</tr>
<tr>
<td>Method Used</td>
<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td></td>
</tr>
<tr>
<td>Alcohol foam, carbon dioxide, dry chemical, water</td>
<td></td>
</tr>
</tbody>
</table>

## Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable (Explosive) Limits</td>
<td></td>
</tr>
<tr>
<td>Flammable</td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td></td>
</tr>
</tbody>
</table>

**Unusual Fire and Explosion Hazards:** When heated to decomposition point, emits toxic fumes of chlorides.
PRODUCT DESIGNATION
2,4 Dichlorophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic yes

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Tremors, convulsions, shortness of breath, irritation of respiratory system.

EFFECTS OF CHRONIC EXPOSURE
Carcinoma

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - drink water, epsom salt solution, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
May react vigorously with oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Put sodium bicarbonate on spill, sweep up the sodium bicarbonate.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles
GLOVES
RESPIRATOR Self-contained

MECHANICAL (GENERAL)

SPECIAL Rubber (butyl)

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

237-3401B
PRODUCT DESIGNATION
03-237-3901
2,5 - Dichlorophenylhydrazine

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
2,5 - Dichlorophenylhydrazine

FORMULA
C12H7NHNH2

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE
% WT. OR VOL.

ESTABLISHED
OSHA STANDARD

LD50

LC50

ORAL
PERCUT.

SPECIES

CONC.

Lowest published lethal dose
Oral - rat 500 mg/kg.

SECTION III PHYSICAL DATA

MW - 177.04

BOILING POINT
°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT
105°C

°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1)

EVAPORATION RATE (Air = 1)

SOLUBILITY IN WATER

Pts/100 pts H2O

Slightly soluble

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Yellow needle-like crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
Not available

METHOD USED

EXTINGUISHING MEDIA
Alcohol foam

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
2,5-dichlorophenylhydrazine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of skin, eyes & mucous membrane,
gastroenteric disturbances, anemia

EFFECTS OF CHRONIC EXPOSURE
Blood & liver damage, loss of appetite

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting,
get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Avoid lead dioxide

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

GLOVES

Rubber

RESPIRATOR

Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

237-3901B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

FORMULA

Dicyclohexylamine

(C\textsubscript{11}H\textsubscript{21})\textsubscript{2}NH\textsubscript{2}

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD\textsubscript{50}

LC\textsubscript{50}

ORAL PERCUT. SPECIES CONC.

373 - rat

Note:

Lowest published lethal dose

oral - mouse 500 mg/kg.

SECTION III PHYSICAL DATA

MW - 181.3

BOILING POINT

255°C

VAPOR PRESSURE

mm Hg.

METHOD USED

o.c.

EVAPORATION RATE

SPECIFIC GRAVITY

SPECIFIC GRAVITY (H\textsubscript{2}O = 1)

0.93

VOLATILE

% Vol.

% Wt.

0.16

Appearance and Odor

Colorless liquid, fishy odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

>210°F

METHOD USED

O.C.

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles & self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Dicyclohexylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
20 PPM (suggested)

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes and respiratory system, if swallowed;
irritation of digestive tract, drowsiness, nausea.

EFFECTS OF CHRONIC EXPOSURE
Weight loss

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid;
inhalation - give oxygen as needed; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
May react with oxidizing materials

WATER REACTIVITY/DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL
RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

237-6401B
SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD$_{50}$ mg/kg

LC$_{50}$ PPM/4 hr.

ORAL PERCUT. SPECIES CONC.

3a,4,7,7a-Tetrahydro-4,7-Methanoindene

C$_{10}$H$_{12}$

SECTION III  PHYSICAL DATA

Mol. Wt. 132.2

BOILING POINT 166.6°C

0°F. VAPOR PRESSURE 47.5°C 47 mm Hg.

MELTING POINT 32.9

0°F. VAPOR DENSITY (Air = 1) 4.55

SPECIFIC GRAVITY (H$_2$O = 1)

0.9766 35°C

EVAPORATION RATE (C = 1)

SOLUBILITY IN WATER Pts/100 pts H$_2$O

VOLATILE % Vol.

APPEARANCE AND ODOR

Colorless crystals.

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 90°F

FLAMMABLE UPPER (EXPLOSIVE)

METHOD USED

LOWER

EXTINGUISHING MEDIA

Alcohol foam, dry chemical, or CO$_2$

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A
PRODUCT DESIGNATION
Dicyclopentadiene

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
TLV 5 PPM, 30 mg/C,M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Generalized congestion, hyperemia, local hemorrhage in many tissues such as kidneys, intestines, stomach, lungs.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, keep warm, and get medical aid.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Can react with oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT
Work clothing

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Face shield

GLOVES
Rubber gloves

RESPIRATOR
All purpose cannister mask

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

237-6901B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Diethylamine

FORMULA

(C₂H₅)₂NH

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀ PPM</th>
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<tbody>
<tr>
<td></td>
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<td></td>
<td>ORAL PERCUT. SPECIES CONC.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>mouse</td>
<td>649</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>rat</td>
<td>540</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rat</td>
<td>820</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rabbit</td>
<td>4000</td>
</tr>
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</table>

SECTION III PHYSICAL DATA

MW = 73.14

BOILING POINT

555°C

MELTING POINT

-38.9°C

SPECIFIC GRAVITY (H₂O = 1)

2.53

0.71

SOLUBILITY IN WATER

VOLATILE

Very soluble

APPEARANCE AND ODOR

Colorless liquid with ammonia-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

<0°F

METHOD USED

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS
**PRODUCT DESIGNATION**

Diethylamine

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**

TLV - 25 PPM, 75 mg/C.M.

**CARCINOGENIC**

No

**PRINCIPLE ROUTES OF ABSORPTION**

Inhalation, ingestion, skin

**SKIN AND EYE IRRITATION**

Severe

**RELEVANT SYMPTOMS OF EXPOSURE**

Eye and mucous membrane irritation; irritation of gastroenteric tract

**EFFECTS OF CHRONIC EXPOSURE**

Irritation of cornea and lungs

**EMERGENCY AND FIRST AID PROCEDURES**

If swallowed - drink water, get medical aid; inhalation - oxygen as needed; wash skin & eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

None

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

None

**INCOMPATABILITY (MATERIALS TO AVOID)**

None

**HAZARDOUS DECOMPOSITION PRODUCTS**

None

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Put sodium bisulfate on spill, then water and drain into sewer.

**WASTE DISPOSAL METHOD**

None

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

None

**PROTECTIVE EQUIPMENT (SPECIFY TYPES)**

- Eye Goggles
- Gloves
- Respirator

**SPECIAL PROTECTIVE EQUIPMENT**

- Overalls

**OTHER PROTECTIVE EQUIPMENT**

- Rubber (butyl)
- Self-contained

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

Store inside standard flammable liquids storage cabinet.

**OTHER PRECAUTIONS**

None

**SIGNATURE**

None

**DATE**

None

237-8401B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Diethylamine Hydrochloride

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50 ORAL</th>
<th>LC50 PERCUT.</th>
<th>SPECIES CONC.</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>none</td>
<td>available</td>
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SECTION III PHYSICAL DATA

MW - 109.60

<table>
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<tr>
<th>PROPERTY</th>
<th>VALUE</th>
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<tbody>
<tr>
<td>BOILING POINT</td>
<td>330°C</td>
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<tr>
<td>MELTING POINT</td>
<td>229°C</td>
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<tr>
<td>SPECIFIC GRAVITY (H2O = 1)</td>
<td>1.05</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>232 Pts/100 pts H2O</td>
</tr>
<tr>
<td>APPEARANCE AND ODOUR</td>
<td>White crystal</td>
</tr>
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</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE EXPLOSIVE LIMITS

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>UPPPER</td>
</tr>
<tr>
<td></td>
<td>LOWER</td>
</tr>
</tbody>
</table>

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Diethylamine Hydrochloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, inhalation of dust

SKIN AND EYE
IRRITATION
moderate

RELEVANT SYMPTOMS OF EXPOSURE
Eye and mucous membrane irritation, irritation of gastroenteric tract.

EFFECTS OF CHRONIC EXPOSURE
Irritation of cornea and lungs.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - drink water, get medical aid;
inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

237-8501B
## SECTION I  SOURCE AND NOMENCLATURE

<table>
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<th>MANUFACTURER'S NAME</th>
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<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
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<tbody>
<tr>
<td>Dimethylsulfoxide</td>
<td></td>
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<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethylsulfoxide</td>
<td>(CH₃)₂SO</td>
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</table>

## SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RD₅₀%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SPECIES</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CONC.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LD₅₀</th>
<th>LC₅₀</th>
<th>SPECIES</th>
<th>CONC.</th>
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</thead>
<tbody>
<tr>
<td>20,000</td>
<td>21,000</td>
<td>Rat</td>
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</tr>
<tr>
<td></td>
<td>12,000</td>
<td>Mouse</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chicken</td>
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</tr>
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</table>

## SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
<th>UNITS</th>
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</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td></td>
<td>°F</td>
</tr>
<tr>
<td>decomposes at 100°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MELTING POINT</td>
<td></td>
<td>°F</td>
</tr>
<tr>
<td>6°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H₂O = 1)</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H₂O</td>
<td></td>
</tr>
<tr>
<td>VOLATILE</td>
<td></td>
<td>% Vol.</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>clear, water white, hygroscopic liquid.</td>
<td></td>
</tr>
</tbody>
</table>

## SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAMMABLE (EXPLOSIVE) LIMITS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UPPER</td>
<td>28.5%</td>
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<tr>
<td>LOWER</td>
<td>2.6%</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>open cup</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXTINGUISHING MEDIA</td>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
</tr>
</tbody>
</table>

### SPECIAL FIRE FIGHTING PROCEDURES

When heated to decomposition point, emits toxic fumes.
PRODUCT DESIGNATION
Dimethylsulfoxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

TERATOGEN

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Burning, stinging and reddening of skin, nausea, vomiting, chills, cramps, corneal opacity.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, transient erythema, musculoskeletal disorder, corneal opacity, garlic-like breath odor.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash from eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

CLOTHES
Rubber

SPECIAL
RESPIRATOR
With chemical filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

240-3505B
# Material Safety Data Sheet

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Family</th>
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<tbody>
<tr>
<td>N, N Dimethyl-M-aminotoluene</td>
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<tr>
<td>(CH₃)₂NC₆H₄CH₃</td>
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</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
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<tbody>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Approximate LD₅₀ or Maximum OSHA Standard**

- Oral: none available
- Percut.: none available
- Species: none available

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.W.</td>
<td>135.20</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>186°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-61°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>0.93</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Liquid</td>
</tr>
</tbody>
</table>

## Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Method Used</td>
<td>Dry chemical, carbon dioxide, foam or water spray</td>
</tr>
</tbody>
</table>

**Extinguishing Media**

- Dry chemical, carbon dioxide, foam or water spray

**SPECIAL FIRE FIGHTING PROCEDURES**

- Wear full protective clothing

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

- Emits toxic fumes when heated
PRODUCT DESIGNATION
Dimethyl-M-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, weakness

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes, skin may be washed with 5% acetic acid to aid removal.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL

RESPIRATOR With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

240-4304B
# Material Safety Data Sheet

## SECTION I  SOURCE AND NOMENCLATURE

**MANUFACTURER'S NAME**

**ADDRESS** (NUMBER, STREET, CITY, STATE, ZIP CODE)

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS CHEMICAL FAMILY**

**FORMULA**

\[(\text{CH}_3)_2\text{NC}_6\text{H}_4\text{CH}_3\]

## SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>(LD_{50}) ORAL</th>
<th>(LC_{50}) PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral - rat</td>
<td>500 mg/kg</td>
<td>none</td>
<td>available</td>
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</table>

## SECTION III  PHYSICAL DATA

**MW** - 135.20

<table>
<thead>
<tr>
<th>PROPERTY</th>
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<th>UNITS</th>
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</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>215°C</td>
<td>°F</td>
</tr>
<tr>
<td>Melting Point</td>
<td></td>
<td>°F</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.94</td>
<td></td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
<td></td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Yellow oil</td>
<td></td>
</tr>
</tbody>
</table>

## SECTION IV  FIRE AND EXPLOSION HAZARD DATA

**Flash Point**

Not available

**Extinguishing Media**

Dry chemical, carbon dioxide, foam or water spray

**Special Fire Fighting Procedures**

Wear full protective clothing

**Unusual Fire and Explosion Hazards**

Emits toxic fumes when heated

**UCN-11322**

240-4404A
**Product Designation:**
Dimethyl-o-Toluidine

**Section V Health Hazard Data**

<table>
<thead>
<tr>
<th>Toxic Level</th>
<th>Carcinogenic</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>No</td>
</tr>
</tbody>
</table>

**Principal Routes of Absorption**

- Inhalation, ingestion, skin
- Skin and eye irritation: moderate

**Relevant Symptoms of Exposure**
Cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions.

**Effects of Chronic Exposure**
Weight loss, anemia, weakness

**Emergency and First Aid Procedures**
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin and eyes, skin may be washed with 5% acetic acid to aid removal.

**Section VI Reactivity Data**

**Conditions Contributing to Instability**

**Conditions Contributing to Hazardous Polymerization**

**Incompatibility (Materials to Avoid)**

**Hazardous Decomposition Products**

**Section VII Spill or Leak Procedures**

**Steps to be Taken in Case Material is Released or Spilled**

**Waste Disposal Method**

**Section VIII Special Protection Information**

<table>
<thead>
<tr>
<th>Ventilation Requirements Local Exhaust</th>
<th>Protective Equipment (Specify Types) EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical (General)</td>
<td>Goggles</td>
</tr>
<tr>
<td>Special</td>
<td>Gloves</td>
</tr>
<tr>
<td>Other Protective Equipment</td>
<td>Respirator</td>
</tr>
<tr>
<td></td>
<td>With proper filter</td>
</tr>
</tbody>
</table>

**Section IX Special Precautions**

**Precautions to Be Taken in Handling and Storage**

**Other Precautions**

**Signature**

**Date**

240-4404B
PRODUCT DESIGNATION

03-240-4504
Dimethy-P-Toluidine

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

FORMULA

N,N-Dimethyl-P-Aminotoluene

(CH₃)₂NC₆H₄CH₃

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCU. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

BOILING POINT

211 °C

6 F. VAPOR PRESSURE

mm Hg.

at 72°C

5

MELTING POINT

0 °F. VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

0.94

VOLATILE

% Vol.

% Wt.

SOLUBILITY IN WATER

Pts/100 pts H₂O

insoluble

appearance and odor

liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

not available

METHOD USED

EXTINGUISHING MEDIA

dry chemical, carbon dioxide, foam or water spray

SPECIAL FIRE FIGHTING PROCEDURES

wear full protective clothing

UNUSUAL FIRE AND EXPLOSION HAZARDS

emits toxic fumes when heated.

UCN-11322

(3 10-74)

240-4504A
PRODUCT DESIGNATION
Dimethyl-P-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOCENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
moderate

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, weakness

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes, skin may be washed with 5% acetic acid to aid removal.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
goggles

MECHANICAL (GENERAL)
GLOVES
rubber

SPECIAL
RESPIRATION
with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

240-4504B
PRODUCT DESIGNATION
03-240-5304
2,4 - Dinitroanisole

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
1 Methoxy-2,4 Dinitrobenzene

CHEMICAL NAME AND SYNONYMS
2,4 - Dinitroanisole

FORMULA
(NO2) C6H3 OCH3

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL APPROXIMATE ESTABLISHED LD50 LC50
OR MAXIMUM OSHA STANDARD ORAL PERCU.. SPECIES CONC.

Note:
Lowest published lethal dose
oral - rat 100 mg/kg

SECTION III PHYSICAL DATA

MW - 198.13

BOILING POINT Sublimes 0 °F. VAPOR PRESSURE mm Hg.

MELTING POINT 95°C 0 °F. VAPOR DENSITY (Air = 1) 6.83

SPECIFIC GRAVITY (H2O = 1) 1.34 EVAPORATION RATE ( ) = 1

SOLUBILITY IN WATER Pts/100 pts H2O VOLATILE % Vol. % Wt.
Slightly soluble

APPEARANCE AND ODOR Colorless crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS UPPPER LOWER

EXTINGUISHING MEDIA explosive - do not fight fire except for unmanned equipment - use water.

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protective clothing for rescue operations.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Severe explosion hazard.
PRODUCT DESIGNATION
2,4-Dinitroanisole

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Blood damage, cyanosis, dizziness, headache, increased pulse rate, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, possible liver damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, give oxygen as needed. If swallowed -
give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Keep away oxidizing materials (explosive) inorganic nitrates, chlorides or ammonium nitrate.

HAZARDOUS DECOMPOSITION PRODUCTS
Oxides of nitrogen.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Safety goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

Rubber

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

240-5304B
MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

SECTION II HAZARDOUS INGREDIENTS

Basic Material

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 mg/kg

LC50

ORAL PERCUT.

SPECIES CONC.

Lowest published lethal dose

intraperitoneal - rat 250 mg/kg

SECTION III PHYSICAL DATA

Molecular Weight (MW) - 183.12

Boiling Point

0°F. Vapor Pressure

mm Hg.

Melting Point

188°C

Specific Gravity (H2O = 1)

1.62

Solubility in Water

Insoluble

Appearance and Odor

Yellow crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point

435°F

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

Extinguishing Media

Explosive - do not fight fire except for unmanned equipment - use water.

Special Fire Fighting Procedures

Wear full protective clothing for rescue operations.

Unusual Fire and Explosion Hazards

Severe explosion hazard.
PRODUCT DESIGNATION

2,4 Dinitroaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust, ingestion, skin

SKIN AND EYE
IRRITATION
moderate

RELEVANT SYMPTOMS OF EXPOSURE
Headache, drowsiness, weakness, cyanosis, respiratory distress.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, possible liver damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Reacts with oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store away from oxidizing materials and heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

240-4804B
PRODUCT DESIGNATION
03-240-5804
M-Dinitrobenzene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
M - Dinitrobenzene

FORMULA
C₆H₄(NO₂)₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀

ORAL PERCUIT. SPECIES CONC.

Skin - man TDLO 4 mg/kg 2 days

Oral - cat. - LDLO 27 mg/kg

42 bird

SECTION III PHYSICAL DATA

MW = 168.11

BOILING POINT

393ºC

MELTING POINT

90ºC

SPECIFIC GRAVITY (H₂O = 1)

1.58

VAPOR PRESSURE

mm Hg.

VAPOR DENSITY (Air = 1)

EVAPORATION RATE ( = 1)

1

SOLUBILITY IN WATER Pts/100 pts H₂O

0.3

APPEARANCE AND ODOOR
Colorless to yellow crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

not available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA
Explosive - do not fight fire except for unmanned equipment - use water.

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protective clothing for rescue operations

UNUSUAL FIRE AND EXPLOSION HAZARDS
Severe explosion hazard.
M-Dinitrobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.15 PPM, 1 mg/C.M. (Skin) CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Blood damage, cyanosis, dizziness, increase pulse rate, headache, unconsciousness

EFFECTS OF CHRONIC EXPOSURE

Weight loss, anemia, possible liver damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, give oxygen as needed; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

Keep from oxidizing materials (explosive) inorganic nitrates, chlorates or ammonium nitrate.

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of nitrogen

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

Protective clothing

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety goggles

GLOVES

Rubber

RESPIRATOR

Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store only in a permanent magazine. Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE DATE

241-5804B
### PRODUCT DESIGNATION

3,5, Dinitrobenzoyl chloride
03-240-6304

### SECTION I SOURCES AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,5 - Dinitrobenzoyl chloride</td>
<td>((\text{NO}_2)_2\text{C}_6\text{H}_5\text{COCl})</td>
</tr>
</tbody>
</table>

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM LD50 LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ORAL PERCU. SPECIES CONC.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ESTABLISHED OSHA STANDARD</th>
<th>ORAL</th>
<th>PERCU.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>none</td>
<td>available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>Boiling Point</th>
<th>°F.</th>
<th>VAPOR PRESSURE at 196°C mm Hg.</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting Point</td>
<td>°F.</td>
<td>VAPOR DENSITY (Air = 1)</td>
<td></td>
</tr>
<tr>
<td>69°C</td>
<td></td>
<td>SPECIFIC GRAVITY (H2O = 1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EVAPORATION RATE</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SOLUBILITY IN WATER</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>VOLATILE % Vol.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% Wt.</td>
<td></td>
</tr>
</tbody>
</table>

| APPEARANCE AND ODOR | |
|---------------------| |
| yellow green crystals | |

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| EXTINGUISHING MEDIA | |
|---------------------| |
| Explosive - do not fight fire except for unmanned equipment - use water. | |

| SPECIAL FIRE FIGHTING PROCEDURES | |
|----------------------------------| |
| Wear full protective clothing for rescue operations | |

| UNUSUAL FIRE AND EXPLOSION HAZARDS | |
|------------------------------------| |
| Severe explosion hazard. | |
PRODUCT DESIGNATION

3,5-Dinitrobenzoyl chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
severe

RELEVANT SYMPTOMS OF EXPOSURE
Headache, cyanosis, dizziness, irritation of respiratory system, skin, eye, mouth and digestive tract burns.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, possible liver damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; give oxygen as needed; if swallowed - drink water, milk of magnesia, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Keep from oxidizing materials (explosive) inorganic nitrates, chlorides or ammonium nitrate.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Safety goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

Rubber

RFSPRIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

240-6304B
# Material Safety Data Sheet

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-bromo-2,4-Dinitrobenzene</td>
<td>(NO) C₆H₄Br</td>
</tr>
</tbody>
</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate LD₅₀ (Oral, Percut, Species, Conc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None available</td>
</tr>
</tbody>
</table>

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>247.02</td>
</tr>
<tr>
<td>Boiling Point (°F)</td>
<td></td>
</tr>
<tr>
<td>Vapour Pressure (mm Hg)</td>
<td></td>
</tr>
<tr>
<td>Melting Point (°F)</td>
<td>74</td>
</tr>
<tr>
<td>Vapour Density (Air = 1)</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate (Air = 1)</td>
<td></td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Pts/100 pts H₂O</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Yellow crystals</td>
</tr>
</tbody>
</table>

## Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Flammable Explosive Limits</th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Extinguishing Media**

Explosive - do not fight fire except for unmanned equipment - use water.

**Special Fire Fighting Procedures**

Wear full protective clothing for rescue operations.

**Unusual Fire and Explosion Hazards**

Severe explosion hazard.
PRODUCT DESIGNATION

2,4 - Dinitrobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC no

PRINCIPAL ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Dermatitis, irritation of respiratory and digestive systems.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (M A I L H I A L S T O A V I D)

Keep from oxidizing materials (explosive) inorganic nitrates, chlorates or hazardous decomposition products

Oxides of nitrogen

ammonium nitrate.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE DATE

240-6804B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 mg/kg

LC50

ORAL PERCUT. SPECIES CONC.

1070 Rat

130 Rabbit

SECTION III PHYSICAL DATA

MW - 202.56

BOILING POINT

315°C

°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

52°C

°F.

VAPOR DENSITY (Air = 1)

6.98

SPECIFIC GRAVITY (H2O = 1)

1.68

EVAPORATION RATE

% Vol.

VOLATILE

% Wt.

SOLUBILITY IN WATER

Pts/100 pts H2O

Insoluble

APPEARANCE AND ODOR

Crystalline (yellow) almond-like odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

382°F

MET. USED

CC

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Explosive - do not fight fire except for unmanned equipment - use water.

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing for rescue operations.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Severe explosion hazard
PRODUCT DESIGNATION
2,4 - Dinitrochlorobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

Carcinogenic
no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

Skin and eye
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Dermatitis, irritation of respiratory and digestive systems, skin sensitized.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Keep from oxidizing materials (explosive)
inorganic nitrates, chlorates and ammonium nitrate

HAZARDOUS DECOMPOSITION PRODUCTS oxides of nitrogen

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL
OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE

goggles

GLOVES rubber

RESPIRATOR self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep from oxidizing materials, combustibles, and source of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

240-7004B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

FORMULA

3,5, dinitro-2-hydroxytoluene

(NO₂)₂C₆H₄C₂H₂(CH₃)OH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀

ORAL

PERCUT.

SPECIES

CONC.

3010

1750

200

2147

rat

hamster

rat

mouse

Lowest published toxic concentration in air

inhalation - human 1 mg/L.C.M.

LD₅₀ - 5 mg/kg oral - human

SECTION III PHYSICAL DATA

MW-198.13

BOILING POINT °F.

VAPOR PRESSURE mm Hg.

60°C

6.82

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (___ = 1)

EQUATION

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE % Vol.

% Wt.

Very slightly soluble

Yellow crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Explosive - do not fight fire except for unmanned equipment - use water.

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing for rescue operations.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Severe explosion hazard.
PRODUCT DESIGNATION
4,6 - Dinitro - O - Cresol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.2 mg/C.M. (Skin)

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Temperature elevation, dermatitis, headache, lassitude, malaise.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, headache

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - drink water, epsom salts solution, get medical aid; inhalation - rest; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
Explosive - keep from oxidizing materials
inorganic nitrates & chlorates, ammonium nitrate.

HAZARDOUS DECOMPOSITION PRODUCTS
Oxides of nitrogen

SECTION VII SPILL OR LEAK PROCEDURES

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE gogges

MECHANICAL (GENERAL)

GLOVES rubber

SPECIAL RESPIRATOR self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep from oxidizing materials, combustibles, and source of heat.

OTHER PRECAUTIONS

SIGNATURE DATE

240-7304B
# Material Safety Data Sheet

## PRODUCT DESIGNATION

| 03-240-7804 | 4,4 - Dinitrodiphenyl |

## SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4 - Dinitrodiphenyl</td>
<td>C₆H₄(NO₂)₂</td>
</tr>
</tbody>
</table>

## SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lowest published toxic dose</th>
<th>oral - rat 860 mg/kg. - neoplastic</th>
</tr>
</thead>
</table>

## SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>VAPOR PRESSURE</th>
<th>VAPOR DENSITY (Air = 1)</th>
<th>EVAPORATION RATE ( = 1)</th>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>SOLUBILITY IN WATER</th>
<th>VOLATILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>233°C</td>
<td>145°C</td>
<td>mm Hg.</td>
<td></td>
<td></td>
<td>Insoluble</td>
<td>% Vol.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Insoluble</td>
<td></td>
</tr>
</tbody>
</table>

| APPEARANCE AND ODOR | |
| Needle-like crystals |

## SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>UPPer</td>
<td>LOWER</td>
</tr>
<tr>
<td>Method used</td>
<td>Alcohol foam, carbon dioxide or dry chemical</td>
<td></td>
</tr>
</tbody>
</table>

| Extinguishing Media | |
| Alcohol foam, carbon dioxide or dry chemical |

| Special Fire Fighting Procedures | |
| Water may cause frothing. | |

| Unusual Fire and Explosion Hazards | |
| ----------------------------------|
PRODUCT DESIGNATION
4, - dinitrodiphenyl

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC neoplastic

PRINCIPAL ROUTES OF ABSORPTION
inhalation (mainly) ingestion

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Nausea, vomiting, central nervous system depression, headache, anemia

EFFECTS OF CHRONIC EXPOSURE
Irritation and lesions of respiratory passages.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; oxygen as needed; if swallowed - get medical aid, gastric lavage; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

RESPIRATOR With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

240-7804B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNonyms

CHEMICAL NAME AND SYNONYMS

CHEMICAL FAMILY

FORMULA

Bis (P-Nitrophenyl) Methane

(No2C6H4)2CH2

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50

LC50

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW - 258.23

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

°F.

184°C.

SPECIFIC GRAVITY (H2O = 1)

VAPOR DENSITY (Air = 1)

EVAPORATION RATE ( ________ = 1)

SOLUBILITY IN WATER

Pts/100 pts H2O

Soluble

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Needle-like crystals.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemicals.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

240-8304A
PRODUCT DESIGNATION
4,4-Dinitrodiphenylmethane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
No

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION
Slight

RELEVANT SYMPTOMS OF EXPOSURE
Difficulty in breathing, cyanosis, vomiting, headache.

EFFECTS OF CHRONIC EXPOSURE
Methemoglobin - former.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside or detached storage preferred, inside storage in standard flammable liquids cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

240-8304B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

α dinitrophenetole

FORMULA

(NO₂)₂C₆H₃OC₆H₅

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.

Lowest published lethal dose

Oral - rat 250 mg/kg.

SECTION III PHYSICAL DATA

MW - 212.16

BOILING POINT

decomposes

°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

86°C

°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY

(H₂O = 1)

EVAPORATION RATE

(% Vol.)

SOLUBILITY IN WATER

Pts/100 pts H₂O

volatile

% Wt.

% Vol.

APPEARANCE AND ODOR

colorless crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

METHOD USED

EXTINGUISHING MEDIA

Explosive - do not fight fire except for unmanned equipment - use water.

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing for rescue operations.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Severe explosion hazard

240-9804A
PRODUCT DESIGNATION

Dinitrophenetole

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available (skin)

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Cyanosis, dizziness, increased pulse rate, headache, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE

Weight loss, anemia, possible liver damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, give oxygen as needed; if swallowed - give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

Explosive - keep from oxidizing materials, inorganic nitrates chlorates or ammonium nitrate.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL RESPIRATOR Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE DATE

240-9804B
**SECTION I  SOURCE AND NOMENCLATURE**

**MANUFACTURER'S NAME**

**EMERGENCY TELEPHONE NO.**

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS**

2,4-dinitrophenol

2,4- dinitrophenol

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>( \text{LD}_{50} ) mg/kg</th>
<th>( \text{LC}_{50} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest published lethal dose</td>
<td></td>
<td></td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Oral - human - 43 mg/kg</td>
<td></td>
<td></td>
<td>13</td>
<td>bird</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>45</td>
<td>Mouse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30</td>
<td>Rabbit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>81</td>
<td>Guinea Pig</td>
</tr>
</tbody>
</table>

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>°F.</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>°F.</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (( \text{H}_2\text{O} = 1 ))</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 Pts H(_2)O</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td></td>
</tr>
</tbody>
</table>

Yellow crystals, bitter taste.

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAMMABLE (EXPLOSIVE) LIMITS</td>
<td>UPPER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>EXTINGUISHING MEDIA</th>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td>Explosive - do not fight fire except for unmanned equipment - use water.</td>
<td>Severe explosion hazard.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th>WEAR FULL PROTECTIVE CLOTHING FOR RESCUE OPERATIONS.</th>
</tr>
</thead>
</table>

UCN-11322
3 10-74

241-0405A
PRODUCT DESIGNATION
2,4 dinitrophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
temperature elevation, dermatitis.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, headache.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - drink water, epsom salts solution, get medical aid; inhalation - rest; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Explosive (keep from oxidizing materials) inorganic nitrates and chlorates, ammonium nitrate

HAZARDOUS DECOMPOSITION PRODUCTS
Oxides of nitrogen.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL) GLOVE:
Rubber (butyl)

SPECIAL RESPIRATOR
Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

241-0405B
PRODUCT DESIGNATION

03-241-0605
2,4 - Dinitrophenyl hydrazine

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE).

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

2,4 - Dinitrophenylhydrazine

FORMULA

\((\text{NO}_2)_2 \text{C}_2 \text{H}_3 \text{NHNH}_2\)

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) mg/kg</th>
<th>LC(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td></td>
<td></td>
<td>654</td>
<td>Rat</td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

MW = 198.14

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>°F.</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>°F.</td>
</tr>
<tr>
<td>194°C</td>
<td></td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H(_2)O = 1)</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H(_2)O</td>
</tr>
<tr>
<td>VOLATILE</td>
<td>% Vol.</td>
</tr>
<tr>
<td>% Wt.</td>
<td></td>
</tr>
</tbody>
</table>

red crystalline powder

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE EXPLOSIVE LIMITS

EXPLOSIVE - do not fight fire except for unmanned equipment - use water

EXTINGUISHING MEDIA

wear full protective clothing for rescue operation

UNUSUAL FIRE AND EXPLOSION HAZARDS

dangerous explosive
**PRODUCT DESIGNATION**

2,4 - Dinitrophenylhydrazine

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available (skin)</td>
<td>no</td>
</tr>
</tbody>
</table>

**PRINCIPLE ROUTES OF ABSORPTION**

- Inhalation, ingestion, skin

**IRRITATION LEVEL**

- Skin and eye

**RELEVANT SYMPTOMS OF EXPOSURE**

- Irritation of skin, eyes and mucous membranes, gastroenteric disturbances, anemia

**EFFECTS OF CHRONIC EXPOSURE**

- Blood and liver damage, loss of appetite

**EMERGENCY AND FIRST AID PROCEDURES**

- Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash from skin & eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

- Avoid strong oxidizing agents.

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

- Goggles

**PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE**

- Gloves

**MECHANICAL (GENERAL)**

- Rubber

**SPECIAL**

- Respirator

- With proper filter

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

- Keep away from heat and sources of ignition or acute fire hazard.

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

241-0605B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

2,4 - Dinitro - 1 methyl benzene

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50

LC50

ORAL PERCUT. SPECIES CONC.

268

rat

1625

mouse

SECTION III PHYSICAL DATA

MW - 182.13

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

300

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

6.27

SPECIFIC GRAVITY (H2O = 1)

1.32

EVAPORATION RATE (A = 1)

0.03

SOLUBILITY IN WATER

Pts/100 pts H2O

VOLATILE

% Vol.

% WI.

yellow needle-like crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

explosive - do not fight fire except for unmanned equipment.

SPECIAL FIRE FIGHTING PROCEDURES

use complete protective clothing for rescue operations.

UNUSUAL FIRE AND EXPLOSION HAZARDS

May explode when exposed to heat.
PRODUCT DESIGNATION
2,4 - Dinitrotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
1.5 mg/C.M.

PRINCIPAL ROUTES OF ABSORPTION
Inhalation of dust, ingestion

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Headache, fatigue, nausea, vomiting, eye irritation, dermatitis

EFFECTS OF CHRONIC EXPOSURE
Loss of weight, jaundice, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
May react with strong oxidizer

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep separate from strong oxidizing and reducing agents.

OTHER PRECAUTIONS

SIGNATURE DATE

241-1405B
**PRODUCT DESIGNATION**

03-241-0905  
2,6 Dinitrothymol

---

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNonyms</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3 dinitro-5 isopropyl -</td>
<td>(NO₂)₂C₆H(CH₃)(C₃H₅)OH</td>
</tr>
<tr>
<td>4 hydroxy - 6 methylbenzene</td>
<td></td>
</tr>
</tbody>
</table>

---

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Lowest published lethal dose  
  oral - rat 100 mg/kg

---

**SECTION III  PHYSICAL DATA**  

<table>
<thead>
<tr>
<th>MW-240.22</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>mm Hg.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>55°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (       = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>insoluble</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
<th>VOLATILE % Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>prismatic crystals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

- FLASH POINT  
  none available

- METHOD USED  
  EXPLOSIVE - do not fight fire except for unmanned equipment - use water.

- EXTINGUISHING MEDIA
  Fire fighting procedures
  Wear full protective clothing for rescue operations.

- SPECIAL FIRE FIGHTING PROCEDURES
  Explosion hazard

---

**UCN-11322**  
(3 10-74)

241-0905A
PRODUCT DESIGNATION
2,6 dinitrothymol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
temperature elevation, dermatitis, headache

EFFECTS OF CHRONIC EXPOSURE
dermatitis, headache

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - drink water, epsom salts solution, get medical aid;
inhalation - rest; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Explosive - keep from oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS
Oxides of nitrogen

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

241-0905B
**PRODUCT DESIGNATION**

03-241-2405  
P-Diiodobenzene

---

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Diiodobenzene</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_6H_4I_2</td>
</tr>
</tbody>
</table>

---

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50}</th>
<th>LC_{50}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>none available</th>
</tr>
</thead>
</table>

---

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>285°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>130°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H_2O = 1)</th>
<th>EVAPORATION RATE</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H_2O</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| APPEARANCE AND ODOR | |
|---------------------||
| Crystalline         | |

---

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>none available</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>water, foam, carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>wear goggles and self-contained breathing apparatus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
</table>
PRODUCT DESIGNATION
P-diiodobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPAL ROUTES OF ABSORPTION
inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
cyanosis, nausea, deep and rapid respiration, irregular pulse, drowsiness, unconsciousness

EFFECTS OF CHRONIC EXPOSURE
Lung, liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

Polyvinyl alcohol

Self-contained breathing apparatus

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

241-2405B
### SECTION I SOURCE AND NOMENCLATURE

**MANUFACTURER'S NAME**

**EMERGENCY TELEPHONE NO.**

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

**CHEMICAL FAMILY**

**FORMULA**

\[ \text{OCH}_2\text{CH}_2\text{OCH}_2\text{CH}_2 \]

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50} mg/kg</th>
<th>LC_{50} ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Oral</td>
<td>Percut.</td>
</tr>
<tr>
<td><strong>Inhalation - human</strong></td>
<td>TCLO 470 PPM</td>
<td></td>
<td>3150</td>
<td>Guinea Pig</td>
</tr>
<tr>
<td><strong>Oral - human</strong></td>
<td>LDLO 500 mg/kg</td>
<td></td>
<td>2000</td>
<td>Cat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2000</td>
<td>7600 Rabbit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4200</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5700</td>
<td>Mouse</td>
</tr>
</tbody>
</table>

### SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>101°C.</th>
<th>VAPOR PRESSURE at 25.2°C.</th>
<th>40 mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MELTING POINT</td>
<td>0°F.</td>
<td>VAPOR DENSITY (Air = 1)</td>
<td>1.2 at 100°F</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H_2O = 1)</td>
<td>0.1</td>
<td>EVAPORATION RATE ( = 1)</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H_2O</td>
<td>VOLATILE</td>
<td>% Vol.</td>
</tr>
<tr>
<td>COLORLESS</td>
<td>LIQUID, FAINT PLEASANT ODOR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>54°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHOD USED</td>
<td></td>
</tr>
<tr>
<td>EXTINGUISHING MEDIA</td>
<td>Alcohol foam, dry chemical, or CO_2</td>
</tr>
<tr>
<td>SPECIAL FIRE FIGHTING PROCEDURES</td>
<td>Wear goggles and self-contained breathing apparatus</td>
</tr>
<tr>
<td>UNUSUAL FIRE AND EXPLOSION HAZARDS</td>
<td>N/A</td>
</tr>
</tbody>
</table>

UCN-11322
(3 10-74)
SECTION V  HEALTH HAZARD DATA

PRODUCT DESIGNATION
P-Dioxane

TOXIC LEVEL
TLV 50 ppm, 180 mg/C.M.

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion, and skin absorption

RELevANT SYMPTOMS OF EXPOSURE
Nausea, vomiting, irritation of eyes and respiratory passages.

EFFECTs OF CHRONIC EXPOSURE
Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, keep warm; if swallowed - wash mouth, give emetic, get medical aid; wash from skin and eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Hazardous Decomposition Products

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towel, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
Use in hood.

LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

GLOVES
Impervious neoprene

RESPIRATOR
Self-contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store away from flammable and oxidizing materials, outside storage is preferred.

OTHER PRECAUTIONS

SIGNATURE                      DATE

241-2906B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

Phenylbenzene

CHEMICAL NAME AND SYNONYMS

Biphenyl

CHEMICAL FAMILY

FORMULA

\( C_{12}H_{10} \)

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE

ESTABLISHED

LD<sub>50</sub>

LC<sub>50</sub>

BASIC MATERIAL

OR MAXIMUM

OSHA

ORAL PERCUT.

STANDARD SPECIES CONC.

% WT. OR VOL.

human rat rabbit

4.4 mg/C.M.

2400 rabbit

2500 rabbit

SECTION III PHYSICAL DATA

MW = 154.22

BOILING POINT

255\(^\circ\)C

VAPOR PRESSURE

5.31 mm Hg.

MELTING POINT

69-70\(^\circ\)C

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1)

0.991

EVAPORATION RATE (--- = 1)

SOLUBILITY IN WATER

No

APPEARANCE AND ODOR

White crystal, pleasant odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

235\(^\circ\)F

FLAMMABLE

EXTINGUISHING MEDIA

carbon dioxide or dry chemical

(EXPLOSIVE) LIMITS

LOWER 0.6%

UPPER 5.1%

SPECIAL FIRE FIGHTING PROCEDURES

water may cause frothing. Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

241-4905A
SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 0.2 PPM, 1 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation (mainly) ingestion

SKIN AND EYE
IRRITATION yes

RELEVANT SYMPTOMS OF EXPOSURE
Nausea, vomiting, central nervous system depression

EFFECTS OF CHRONIC EXPOSURE
Irritation and lesions of respiratory passages

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - get medical aid, gastric lavage - wash from eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towel; evaporate on glass or iron dish in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Polyvinyl alcohol

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
NATF

241-4905B
**SECTION I  SOURCE AND NOMENCLATURE**

**MANUFACTURER'S NAME**

**ADDRESS** (NUMBER, STREET, CITY, STATE, ZIP CODE)

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS**

M Terphenyl

**FORMULA**

\[ C_{10}H_{12} \]

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50})</th>
<th>LC(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION III  PHYSICAL DATA**

MW = 230.29

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>363(^\circ)C</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>87(^\circ)C</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H(_2)O = 1)</th>
<th>1.16</th>
<th>EVAPORATION RATE (1)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H(_2)O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
</table>

| Appearance and Odor | Crystals | |
|---------------------|----------||

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>375(^\circ)F</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>Q.C.</th>
</tr>
</thead>
</table>

| EXTINGUISHING MEDIA | Water, carbon dioxide, dry chemical |

| SPECIAL FIRE FIGHTING PROCEDURES | Water or foam may cause frothing. |

| UNUSUAL FIRE AND EXPLOSION HAZARDS | |

UCN-11322

[3.10-74] 241-6405A
PRODUCT DESIGNATION

M Diphenylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

1 PPM, 9 mg/C.M. (ceiling values)

PRINCIPAL ROUTES OF ABSORPTION

Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE

Eye, skin & respiratory irritation, nausea, vomiting

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage, pulmonary edema, bronchopneumonia

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - get medical aid, gastric lavage; wash from skin and eyes

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE

Goggles

GLOVES

Polyvinyl alcohol

RESPIRATOR

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

241-6405B
**PRODUCT DESIGNATION**
03-241-6505
O-Diphenyl benzene

**MATERIAL SAFETY DATA SHEET**

### SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-Terphenyl</td>
<td>C₆H₉C₆H₆C₆H₅</td>
</tr>
</tbody>
</table>

### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>none available</th>
<th>none available</th>
<th>none available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>322°C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>VAPOR DENSITY (Air = 1)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>57°C</td>
<td>7.95</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (-------)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.14</td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>VOLATILE % Vol.</th>
<th>VOLATILE % Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline</td>
<td></td>
</tr>
</tbody>
</table>

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>325°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>O.C.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>water, carbon dioxide, dry chemical</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>water or foam may cause frothing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**UCN-11322  (3 10-74)**

**241-6505A**
PRODUCT DESIGNATION
O-Diphenyl benzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
1 PPM, 9 mg/C.M. (Ceiling values)

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin and respiratory irritation; nausea, vomiting

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage, pulmonary edema, bronchopneumonia

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - get medical aid, gastric lavage; wash from skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PRESERVATIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles

MECHANICAL (GENERAL)

CLOTHING Polyvinyl alcohol

SPECIAL RESPIRATOR With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

241-6505B
**PRODUCT DESIGNATION**

03-241-6605  
P-Diphenylbenzene

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>P Terphenyl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>C_{10}H_{12}</td>
</tr>
</tbody>
</table>

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50}</th>
<th>LC_{50}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lowest published lethal dose  
Oral = rat 500 mg/kg.

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW</th>
<th>230.29</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>376°F</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>213°F</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H_{2}O = 1)</td>
<td>1.24</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H_{2}O</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>crystalline</td>
</tr>
</tbody>
</table>

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>405°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHOD USED</td>
<td>O.C.</td>
</tr>
<tr>
<td>EXTINGUISHING MEDIA</td>
<td>Water, carbon dioxide, dry chemical</td>
</tr>
<tr>
<td>SPECIAL FIRE FIGHTING PROCEDURES</td>
<td>Water or foam may cause frothing.</td>
</tr>
</tbody>
</table>

UCN-11322  
13 10-74
PRODUCT DESIGNATION
P-Diphenylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
1 PPM, 9 mg/C.M. (Ceiling Value)  CARCINOGENIC  no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion  SKIN AND EYE  IRRITATION  Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin & respiratory irritation; nausea, vomiting

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage, pulmonary edema, bronchopneumonia

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - get medical aid, gastric lavage; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST  PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles
MECHANICAL (GENERAL)  GLOVES  Polyvinyl alcohol
SPECIAL  RESPIRATOR  With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE  DATE

241-6605B
PRODUCT DESIGNATION
03-242-0606
As-Diphenylhydrazine Hydrochloride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
CHEMICAL NAME AND SYNONYMS
1,1-Diphenylhydrazine hydrochloride

FORMULA
(C₆H₅)₂NNH₂HCl

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td>none available</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA
MW - 220.70

BOILING POINT not available

MELTING POINT not available

SPECIFIC GRAVITY (H₂O = 1)

SPECIES CONC.

SOLUBILITY IN WATER Pt/l00 pts H₂O slightly soluble

APPEARANCE AND ODOR white to grey white crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available

METHOD USED

EXTINGUISHING MEDIA alcohol foam, water, carbon dioxide

FLAMMABLE (EXPLOSIVE) LIMITS

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

242-0606A
**PRODUCT DESIGNATION**
As Diphenylhydrazine hydrochloride

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td>no</td>
</tr>
</tbody>
</table>

**PRINCIPAL ROUTES OF ABSORPTION**
inhalation of dust, ingestion, skin

**SKIN AND EYE IRRITATION**
severe

**RELEVANT SYMPTOMS OF EXPOSURE**
Irritation of skin, eyes and mucous membranes, gastroenteric disturbances, anemia

**EFFECTS OF CHRONIC EXPOSURE**
Blood and liver damage, loss of appetite.

**EMERGENCY AND FIRST AID PROCEDURES**
Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash from skin & eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**
Avoid lead dioxide

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**
Steps to be taken in case material is released or spilled

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Goggles</td>
</tr>
<tr>
<td></td>
<td>MECHANICAL (GENERAL)</td>
</tr>
<tr>
<td></td>
<td>GLOVES</td>
</tr>
<tr>
<td></td>
<td>Rubber</td>
</tr>
<tr>
<td></td>
<td>SPECIAL</td>
</tr>
<tr>
<td></td>
<td>RESPIRATOR</td>
</tr>
</tbody>
</table>

**OTHER PROTECTIVE EQUIPMENT**

**SECTION IX SPECIAL PRECAUTIONS**
Precautions to be taken in handling and storage

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

242-0606B
# Material Safety Data Sheet

**Product Designation**

03-242-2606
1,4 - Diphenylsemicarbazide

## Section I  Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name and Synonyms</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4 - Diphenylsemicarbazide</td>
<td>C₆H₆N₂NHCONH₂C₆H₆</td>
</tr>
</tbody>
</table>

## Section II  Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or VOL.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
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</table>

## Section III  Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td></td>
</tr>
<tr>
<td>Melting Point</td>
<td>180°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>7.8</td>
</tr>
<tr>
<td>Solubility in Water (pts/100 pts H₂O)</td>
<td>very slightly soluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>crystals</td>
</tr>
</tbody>
</table>

## Section IV  Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>none available</td>
</tr>
<tr>
<td>Method Used</td>
<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>alcohol foam, carbon dioxide, dry chemical</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Flammable (Explosive) Limits</th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Unusual Fire and Explosion Hazards**

when heated to decomposition emits toxic fumes
PRODUCT DESIGNATION
1,4-Diphenylsemicarbazide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
severe

RELEVANT SYMPTOMS OF EXPOSURE
irritation of skin, eyes and mucous membranes,
gastroenteric disturbances, anemia

EFFECTS OF CHRONIC EXPOSURE
Blood and liver damage, loss of appetite

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting,
get medical aid; wash from eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

SPECIAL

OTHER PROTECTIVE EQUIPMENT

RESPIRATOR

rubber

self-contained

goggles

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

242-2606B
## SECTION I SOURCE AND NOMENCLATURE

**MANUFACTURER'S NAME**

**EMERGENCY TELEPHONE NO.**

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS**

Di-2-Propanolamine

**CHEMICAL FAMILY**

**FORMULA**

\[ (\text{C}_2\text{H}_5\text{OH})_2\text{NH} \]

## SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) mg/C.M.</th>
<th>LC(_{50}) ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LD\(_{50}\) mg/C.M.** 6720  Rat

## SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>249(^\circ) F.</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>42(^\circ) F.</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H(_2)O = 1)</td>
<td>4.59</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H(_2)O</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td></td>
</tr>
</tbody>
</table>

## SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAMMABILITY (EXPLOSIVE)</td>
<td></td>
</tr>
<tr>
<td>LOWER LIMIT</td>
<td></td>
</tr>
<tr>
<td>UPPER LIMIT</td>
<td></td>
</tr>
</tbody>
</table>

**METHOD USED**

OC

**EXTINGUISHING MEDIA**

alcohol foam, carbon dioxide, dry chemical

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

---

UCN-11322

242-5606A
PRODUCT DESIGNATION
Di-Iso-propanolamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye and skin burns, nausea, headache, respiratory tract irritation, lung edema

EFFECTS OF CHRONIC EXPOSURE
Weight loss, clouding of cornea

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - drink water, get medical aid; wash from hands and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE goggles

MECHANICAL (GENERAL)

GLOVES rubber

SPECIAL

RESPIRATOR with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

242-5606B
**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Di-Isopropylamine</td>
<td>((C_3H_7)_2NH)</td>
</tr>
</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) mg/kg</th>
<th>LC(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Lowest published lethal concentration in air inhalation - rat - 1000 PPM - 4 hours

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td>84°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F</th>
<th>VAPOR DENSITY (Air = 1)</th>
<th>3.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>-61°C</td>
<td></td>
<td>EVAPORATION RATE (</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY</th>
<th>(H(_2)O = 1)</th>
<th>0.722</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Prt/100 pt (\text{H}_2\text{O})</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>soluble</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Colorless liquid, with fishy odor</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>°F</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>30°F</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>O.C.</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th>alcohol foam, carbon dioxide, dry chemical</th>
</tr>
</thead>
</table>

| SPECIAL FIRE FIGHTING PROCEDURES |
|                                 |
| water may be ineffective, wear full protective clothing. |

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
<th></th>
</tr>
</thead>
</table>
PRODUCT DESIGNATION
Di-Isopropylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
5 PPM, 20 mg/C.M. Skin

PRINCIPAL ROUTES OF ABSORPTION
inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
respiratory tract irritation, lung edema, skin & eye burns,
nausea, headache.

EFFECTS OF CHRONIC EXPOSURE
clouding of cornea

EMERGENCY AND FIRST AID PROCEDURES
inhalation - rest; if swallowed - drink water, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

goggles

SPECIAL

GLOVES

rubber

RESPIRATOR

with proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
outside or detached storage is preferable-inside storage should be in a standard flammable liquid storage room or cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

242-6106B
**PRODUCT DESIGNATION**

CAS: 000142847

**MATERIAL DESIGNATION**

03-242-6206

Di-N-propyl amine

---

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Di-Propylamine</td>
<td>((C_7H_{17})_2\text{NH})</td>
</tr>
</tbody>
</table>

---

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50} mg/kg ORAL</th>
<th>LC_{50}</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>

- **Lowest published lethal concentrations in air:**
  - Inhalation - rat 1000 PPM - 4 hours

---

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW - 101.22</th>
<th>BOILING POINT 105°C</th>
<th>VAPOR PRESSURE mmHg.</th>
</tr>
</thead>
</table>

| MELTING POINT -40°C | VAPOR DENSITY \((\text{Air} = 1)\) | 3.5 |
| SPECIFIC GRAVITY \((\text{H}_2\text{O} = 1)\) | EVAPORATION RATE \((\text{mm} \times \text{H}_2\text{O} = 1)\) | 0.74 |

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>VOLATILE % Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**APPEARANCE AND ODOR**

- Water white, fishy odor

---

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT 63°C</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**METHOD USED**

- O.C.

**EXTINGUISHING MEDIA**

- Foam, carbon dioxide, dry chemical

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

---

U.S. National Library of Medicine (3/10/74)
PRODUCT DESIGNATION  
Di-N-propylamine

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL  
none available

CARCINOGENIC  NO

PRINCIPLE ROUTES OF ABSORPTION  
inhalation, ingestion (mainly)

SKIN AND EYE  
IRRITATION  severe

RELEVANT SYMPTOMS OF EXPOSURE  
respiratory tract irritation, lung edema, eye & skin

burns, nausea, headache.

EFFECTS OF CHRONIC EXPOSURE  
Weight loss, clouding of cornea.

EMERGENCY AND FIRST AID PROCEDURES  
Inhalation - rest; if swallowed - drink water, get

medical aid; wash from skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST  
PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE  
goggles

GLOVES  
rubber

RESPIRATOR  
with proper filter

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE  
outside or detached storage is preferable-inside storage should be in a

standard flammable liquid storage room or cabinet.

OTHER PRECAUTIONS

SIGNATURE  
DATE

242-6206B
PRODUCT DESIGNATION
03-242-6606
N,N-Di-N-Propylaniline

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

N,N-Dipropylaniline

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% WT. OR VOLE.</td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SPECIES</td>
<td>CONC.</td>
</tr>
</tbody>
</table>

none available

SECTION III PHYSICAL DATA

MW - 177.28

BOILING POINT
245°C

VAPOR PRESSURE
at 177°C

MELTING POINT

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

0.91

EVAPORATION RATE

VOLATILE

insoluble

APPEARANCE AND ODOR
yellow oil

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
none available

METHOD USED

EXTINGUISHING MEDIA
alcohol foam, carbon dioxide, water spray, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

242-6606A
PRODUCT DESIGNATION
N,N-Di-N-Propylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
headache, drowsiness, cyanosis, mental confusion, convulsions.

EFFECTS OF CHRONIC EXPOSURE
Fatigue, loss of appetite, headache, dizziness

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE goggles

MECHANICAL (GFCP,RAI)

NI OVS polyvinyl

SPECIAL RESPIRATOR self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

242-6606B
PRODUCT DESIGNATION
03-242-7106
Di-N-propylcarbinol

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Heptanol 4

FORMULA

(C₇H₁₅O)CHOH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.

none available

SECTION III PHYSICAL DATA

MW = 116.2

BOILING POINT

°F

VAPOR PRESSURE

mm Hg.

156°C

MELTING POINT

°F

VAPOR DENSITY (AIR = 1)

-37°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE

0.82

SPECIES

insoluble

SOLUBILITY IN WATER

Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

insoluble

APPEARANCE AND ODOR

liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)
PRODUCT DESIGNATION
Di-N-propylcarbinol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
not available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Twitching, narcosis, weakness, tremors, convulsions, eye irritation.

EFFECTS OF CHRONIC EXPOSURE
liver damage

EMERGENCY AND FIRST AID PROCEDURES
inhalation - rest; if swallowed - induce vomiting, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

EYE goggles

SPECIAL

GLOVES rubber

OTHER PROTECTIVE EQUIPMENT

RESPIRATOR

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

242-7106B
SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
1-chloro-2,3-Epoxypropane

FORMULA
C\textsubscript{6}H\textsubscript{4}OCl

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM
ESTABLISHED
% WT. OR VOL.
OSHA STANDARD

LDL\textsc{O} - oral - human 50 mg/kg

LDL\textsc{O} - oral - rat 90

LDL\textsc{O} - oral - mouse 238

LC\textsc{O} - inhalation - human 20 ppm eye irritation

LC\textsc{O} - inhalation - mouse 515

LC\textsc{O} - inhalation - rabbit

Inhalation - mouse LC\textsc{O} - 7414 PPM - 30 months

SECTION III  PHYSICAL DATA

MW - 92.52

BOILING POINT
116°C

MELTING POINT
-58°C

SPECIFIC GRAVITY (H\textsubscript{2}O = 1)
1.18

SOLUBILITY IN WATER
Soluble

APPEARANCE AND ODOR
colorless, mobile liquid, irritating chloroform-like odor.

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
105°F

METHOD USED
Open cup

EXTINGUISHING MEDIA
Alcohol foam, water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES.
Wear full protective clothing -

UNUSUAL FIRE AND EXPLOSION HAZARDS
When heated to decomposition, emits highly toxic fumes of phosgene.
PRODUCT DESIGNATION
Epichlorohydrin

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 2 ppm, 8 mg/C.M. (skin)

CARCINOGENIC Yes

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, inhalation, skin

SKIN AND EYE IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
cyanosis, eye irritation, severe skin & eye burns, central nervous system depression and irritation of respiratory tract.

EFFECTS OF CHRONIC EXPOSURE
Eye irritation, chronic weariness and stomach upset.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, oxygen as needed; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION
Polymerizes exothermically in the presence of water, acids, bases -

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb with paper towels, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE
Safety glasses

MECHANICAL (GENERAL)
GLOVES
rubber

SPECIAL
RESPIRATION
with proper filter

OTHER PROTECTIVE EQUIPMENT

Full protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Separate from acids, bases and anhydrous metal halides - store in well ventilated area.

OTHER PRECAUTIONS

SIGNATURE

DATE

246-0407B
**PRODUCT DESIGNATION**

03-244-1707

Ethanalamine

---

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
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<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
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<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
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</thead>
<tbody>
<tr>
<td>2-amino ethanol</td>
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**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50 mg/kg</th>
<th>LC50</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCU.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2100</td>
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<td>1000</td>
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**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
<th>2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>111°C</td>
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<td></td>
<td></td>
<td>11°C</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>SPECIFIC GRAVITY (H2O = 1)</td>
<td>1.02</td>
<td>EVAPORATION RATE (--- --- ---)</td>
<td>≤ 1</td>
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</tbody>
</table>

SOLUBILITY IN WATER: Pts/100 pts H2O 

VOLATILE: % Vol. % Wt. 

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>°F.</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>185°F</td>
<td></td>
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</table>

**EXTINGUISHING MEDIA**

alcohol foam, water, carbon dioxide, dry chemical

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**
PRODUCT DESIGNATION
Ethanolamine

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
3 PPM, 6 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
ingestion, inhalation

RELEVANT SYMPTOMS OF EXPOSURE
Affects central nervous system, eye and respiratory tract irritation.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, decrease in alertness, skin irritation, liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - drink water, fruit juice, get medical aid;
    inhalation - rest; wash eyes and skin.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
    Take up liquid in sodium bisulfite, then add water.

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
    EYE
        goggles
    GLOVES
        rubber (butyl)
    RESPIRATOR
        with proper filter

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
    Store in well-ventilated area, away from flammable material.

OTHER PRECAUTIONS

SIGNATURE  DATE

244-1707B
SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

Ethyl Ether

CHEMICAL NAME AND SYNONYMS

Ethyl Ether

FORMULA

C₂H₅OC₂H₅

SECTION II  HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀ PPM

LD₅₀ - oral - human 420 mg/kg

1700 Rat

TCLO - inhalation - human 200 PPM

SECTION III  PHYSICAL DATA

MW - 74.12

BOILING POINT

°F. VAPOR PRESSURE mm Hg.

35°C 60°F. at 15°C.

MELTING POINT

-116°C.

SPECIFIC GRAVITY (H₂O = 1)

0.71

SOLUBILITY IN WATER Pts/100 pts H₂O

7.5 VOLATILE % Vol.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

-49°F.

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER 36%

METHOD USED

Closed cup

LOWER 1.9%

EXTINGUISHING MEDIA

Dry chemical or carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Forms explosive peroxides with oxygen.
PRODUCT DESIGNATION
Ethyl Ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 400 PPM, 1200 mgC.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION Yes

RELEVANT SYMPTOMS OF EXPOSURE
Nasal irritation, drowsiness, dizziness, mental confusion, faintness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Loss of appetite, exhaustion, headache, sleepiness, dizziness.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
Reacts with oxygen to produce explosive peroxides shelf life 12 months.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY MATERIALS TO AVOID

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEP$ TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Safety glasses

MECHANICAL (GENERAL) GLOVES

SPECIAL RESPIRATOR

OTHER PROTECTIVE EQUIPMENT
Self-contained breathing apparatus

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Detached outside storage preferred. Inside storage in flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

246-1908B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
1,1'-Oxybisbutane

CHEMICAL NAME AND SYNONYMS
Dibutyl Ether

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
LD50 mg/kg
LC50
BASIC MATERIAL OR MAXIMUM OSHA STANDARD ORAL PERCUT. SPECIES CONC.

11,000 Rat

Lowest published lethal concentration in air

10,000 Rabbit

inhalation - rat - 4000 PPM - 4 hours

SECTION III PHYSICAL DATA

MW 130.22

BOILING POINT 142°F

VAPOR PRESSURE at 20°C 4.8 mm Hg.

MELTING POINT -95°C

VAPOR DENSITY (Air = 1) 4.48

SPECIFIC GRAVITY (H2O = 1) EVAPORATION RATE

0.77 % Vol.

SOLUBILITY IN WATER Pts/100 pts H2O VOLATILE % Wt.

insoluble

APPEARANCE AND ODOR clear liquid with etherial odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 77°F

FLAMMABLE (EXPLOSIVE) LIMITS

METHOD USED Closed cup

EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical

SPECIFIC FIRE FIGHTING PROCEDURES water may be ineffective. Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
N Butyl Ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
100 PPM suggested

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Irritating to eyes and nose, central nervous system depression, drowsiness, dizziness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid, gastric lavage; inhalation - give oxygen as needed; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
May form explosive peroxides.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb with paper, evaporate from paper in hood.

WASTE DISPOSAL METHOD
Dissolve in benzene or petroleum ether and burn.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL
OTHER PROTECTIVE EQUIPMENT
body shield

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
- goggles
- rubber
- self-contained breathing apparatus

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside storage is preferable. Inside storage in flammable liquids room or cabinet.

OTHER PRECAUTIONS

SIGNATURE DATE

246-4308B
PRODUCT DESIGNATION
03-237-9401
Diethylaminochlorobenzene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
N,N Diethyl chloroaniline

FORMULA
(C2H5)2NC6H4Cl

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50

LC50

ORAL PERCUT. SPECIES CONC.

None available

SECTION III PHYSICAL DATA

MW - 183.69

BOILING POINT 0 F.

VAPOR PRESSURE

at 96°C 1.5 mm Hg.

MELTING POINT 39°C.

SPECIFIC GRAVITY (H2O = 1)

VAPOR DENSITY (Air = 1)

EVAPORATION RATE (________ = 1)

SPECIES

SOLUBILITY IN WATER Pts/100 pts H2O

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Needle-like crystals.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide and dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

237-9401A
PRODUCT DESIGNATION
Diethylaminochlorobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion skin

SKIN AND EYE IRRITATION
Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Weakness, tremors, cyanosis, drowsiness, central nervous system depressed.

EFFECTS OF CHRONIC EXPOSURE
Fatigue, loss of appetite, headache, dizziness.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Polyvinyl alcohol

SPECIAL
RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE; 237-9401B
**PRODUCT DESIGNATION**

03-238-0102
2-Diethylamino - 1,4-Dimethylbenzene

**MATERIAL SAFETY DATA SHEET**

---

**SECTION I SOURCE AND NOMENCLATURE**

**MANUFACTURER'S NAME**

**EMERGENCY TELEPHONE NO.**

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS**

N,N Diethyl 3,6 Dimethylaniline

**CHEMICAL FAMILY**

\((\text{C}_2\text{H}_5)_2\text{NCH}_3\text{H}_3(\text{CH}_3)_2\)

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**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>(\text{LD}_{50})</th>
<th>(\text{LC}_{50})</th>
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</thead>
<tbody>
<tr>
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<td>ORAL SPECIES</td>
<td>CONC.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>PERCUT. SPECIES</td>
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</tr>
</tbody>
</table>

None available

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**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>0°F.</th>
<th>VAPOR PRESSURE at 96°F.</th>
<th>11 mm Hg.</th>
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</thead>
<tbody>
<tr>
<td>MELTING POINT</td>
<td>0°F.</td>
<td>VAPOR DENSITY (Air = 1)</td>
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<tr>
<td>SPECIFIC GRAVITY (H₂O = 1)</td>
<td>EVAPORATION RATE (         = 1)</td>
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<td></td>
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<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H₂O</td>
<td>VOLATILE</td>
<td>% Vol.</td>
</tr>
</tbody>
</table>

Colorless to yellow liquid.

---

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

**FLASH POINT**

None available

**METHOD USED**

Alcohol foam, dry chemical, carbon dioxide.

**EXTINGUISHING MEDIA**

Alcohol foam, dry chemical, carbon dioxide.

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**
PRODUCT DESIGNATION
2 Diethylamino - 1,4 - Dimethylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE Weakness, tremors, cyanosis, drowsiness, central nervous system depressant.

EFFECTS OF CHRONIC EXPOSURE Fatigue, loss of appetite, headache, dizziness.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE Equipment (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Polyvinyl Alcohol

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

238-0102B
PRODUCT DESIGNATION
03-238-0602
4-Diethylamino - 1,3-Dimethyl benzene

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

CHEMICAL FAMILY

FORMULA

\( \text{N, N-Diethyl 2,4-Dimethylaniline} \)

\( (\text{C}_2\text{H}_5)\text{NCH}_3 \) \( (\text{CH}_3)\text{2} \)

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50}</th>
<th>LC_{50}</th>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
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<td>None available</td>
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SECTION III PHYSICAL DATA

<table>
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<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE at 102°C.</th>
<th>14 mm Hg.</th>
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<tr>
<td>MELTING POINT</td>
<td>°F.</td>
<td>VAPOR DENSITY (Air = 1)</td>
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<tr>
<td>SPECIFIC GRAVITY (H(_2)O = 1)</td>
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<td>EVAPORATION RATE (( \text{eq} = 1 ))</td>
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<tr>
<td>SOLUBILITY IN WATER</td>
<td>% Vol.</td>
<td>VOLATILE</td>
<td>% Wt.</td>
</tr>
</tbody>
</table>

APPEARANCE AND ODOR

- Colorless to yellow liquid.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>None available</th>
</tr>
</thead>
</table>

METHOD USED

EXTINGUISHING MEDIA

- Alcohol foam, dry chemical, carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
4-Diethylamino - 1,3 - Dimethylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
Moderate

RELEVANT SYMPTOMS OF EXPOSURE
Weakness, tremors, cyanosis, drowsiness, central nervous system depressant.

EFFECTS OF CHRONIC EXPOSURE
Fatigue, loss of appetite, headache, dizziness.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MACHANICAL (GENERAL)

GLOVES
Polyvinyl alcohol

SPECIAL

RESPRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

238-0602B
**PRODUCT DESIGNATION**
03-238-3102
Diethylaniline

**SECTION I SOURCE AND NOMENCLATURE**

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<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
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<tbody>
<tr>
<td>diethylphenylamine</td>
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<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NN diethylaniline</td>
<td>C₆H₅N(C₂H₅)₂</td>
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</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>782</td>
<td>Rat</td>
</tr>
</tbody>
</table>

**SECTION III PHYSICAL DATA**

| MW | 149.23 |

| BOILING POINT | °F | 215.5°C |
| VAPOR PRESSURE | mm Hg | 1 |
| MELTING POINT | °F | -38°C |
| VAPOR DENSITY | (Air = 1) | 5.15 |
| SPECIFIC GRAVITY | (H₂O = 1) | 0.9351 |

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.44</td>
<td></td>
<td></td>
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</table>

**APPEARANCE AND ODOR**
Colorless to yellow liquid

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

| FLASH POINT | °F | 185°F |
| METHOD USED |     |       |

| EXTINGUISHING MEDIA |  |
| Alcohol foam, water spray, carbon dioxide, dry chemical |

| UNUSUAL FIRE AND EXPLOSION HAZARDS |  |
|------------------------------------|  |
PRODUCT DESIGNATION

diethylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

not available

CARCINOGENIC

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

yes

RELEVANT SYMPTOMS OF EXPOSURE

Weakness, tremors, cyanosis, drowsiness, central nervous system depressant

EFFECTS OF CHRONIC EXPOSURE

Fatigue, loss of appetite, headache, dizziness

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, get medical aid; if swallowed - wash mouth, give emetic, get medical aid; wash from eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Polyvinyl alcohol

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

238-3102B
**PRODUCT DESIGNATION**
03-238-4602
Diethyl-M-Toluidine

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<tbody>
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<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
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<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
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</thead>
<tbody>
<tr>
<td>N,N,-Diethyl-M-Toluidine</td>
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<table>
<thead>
<tr>
<th>CHEMICAL FAMILY</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>((\text{C}_2\text{H}_5)_2\text{NC}_6\text{H}_4\text{CH}_3)</td>
</tr>
</tbody>
</table>

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50}</th>
<th>LC_{50}</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCU.</td>
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<td></td>
<td></td>
<td></td>
<td>None</td>
<td>available</td>
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</tbody>
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<table>
<thead>
<tr>
<th>BOILING POINT</th>
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<table>
<thead>
<tr>
<th>MELTING POINT</th>
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</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY ((\text{H}_2\text{O} = 1))</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER (\text{Pts}/100 \text{ pts H}_2\text{O})</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLETILE % Vol. % Wt.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark colored liquid</td>
</tr>
</tbody>
</table>

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>97(^\circ)C at 7 mm Hg.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>VAPOR PRESSURE</td>
</tr>
<tr>
<td>97(^\circ)C at 7 mm Hg.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (\text{H}_2\text{O} = 1)</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER (\text{Pts}/100 \text{ pts H}_2\text{O})</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLETILE % Vol. % Wt.</td>
</tr>
</tbody>
</table>

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>METHODO USED</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide, dry chemical, foam or water spray</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear full protective clothing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emits toxic fumes when heated</td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
Diethyl-M-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, weakness

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash skin & eyes, skin may be washed with a 5% solution of acetic acid to aid removal.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

GLOVES

RESPIRATOR

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

238-4602B
# Material Safety Data Sheet

## Section I. Source and Nomenclature

**Product Designation:**
03-238-4702
Diethyl-O-Toluidine

**Manufacturer's Name:**

**Address (Number, Street, City, State, Zip Code):**

**Trade Name and Synonyms:**

**Chemical Name and Synonyms:**

**Chemical Family:**

**Formula:**

\( \text{C}_9 \text{H}_{14} \text{NC} \text{H}_3 \)

## Section II. Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or VOL.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>

**LD₅₀:**

**LC₅₀:**

## Section III. Physical Data

**MW:** 135.23

**Boiling Point:** 209°C

**Melting Point:**

**Specific Gravity (H₂O = 1):**

**Evaporation Rate:**

**Solubility in Water:** Pts/100 pts H₂O

**Volatile:** % Vol.

**Appearance and Odor:** Dark colored liquid

## Section IV. Fire and Explosion Hazard Data

**Flash Point:** None available

**Method Used:**

**Extinguishing Media:**

Carbon dioxide, dry chemical, foam or water spray

**Special Fire Fighting Procedures:**

Wear full protective clothing

**Unusual Fire and Explosion Hazards:**

Emits toxic fumes when heated

UCN-11322
(3 10-74)

238-4702A
PRODUCT DESIGNATION
Diethyl-O-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions

IRRITATION
yes

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, weakness

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic; get medical aid; wash skin & eyes, skin may be washed with a 5% acetic acid to aid removal.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
Can react with oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles
MECHANICAL (GENERAL)
GLOVES
SPECIAL RESPIRATOR
Rubber
RESPIRATOR
With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

238-4702B
# Material Safety Data Sheet

**Product Designation:**
03-238-4802  
Diethyl-P-Toluidine

## Section I  Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name and Synonyms</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Diethyl-P-Toluidine</td>
<td>((C_2H_5)_2NC_6H_4CH_2)</td>
</tr>
</tbody>
</table>

## Section II  Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD(_{50})</th>
<th>LC(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity Measures</th>
<th>Oral</th>
<th>Percut.</th>
<th>Species</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>None</td>
<td>available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Section III  Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>229°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (H(_2)O = 1)</td>
<td>0.92</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Pts/100 pts H(_2)O</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Dark colored liquid</td>
</tr>
</tbody>
</table>

## Section IV  Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Method Used</td>
<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Carbon dioxide, dry chemical, foam or water spray</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td>Wear full protective clothing</td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td>Emits toxic fumes when heated</td>
</tr>
</tbody>
</table>

UCN-11322  
(3 10.74)  
238-4802A
PRODUCT DESIGNATION
Diethyl-P-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION yes

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, weakness

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash from skin & eyes, skin may be washed with a 5% acetic acid solution to aid removal.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
May react vigorously with oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Coggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

238-4802B
PRODUCT DESIGNATION
03-238-5302
P,P - Difluorodiphenyl

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
CHEMICAL NAME AND SYNONYMS
4,4 Difluorobiphenyl

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
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<tbody>
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</table>

SECTION III PHYSICAL DATA
MW - 190.18

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOILING POINT</td>
<td>455°C</td>
</tr>
<tr>
<td>VAPOR PRESSURE</td>
<td>mm Hg</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>95°C</td>
</tr>
<tr>
<td>VAPOR DENSITY (Air = 1)</td>
<td></td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H₂O = 1)</td>
<td>1.04</td>
</tr>
<tr>
<td>EVAPORATION RATE (</td>
<td></td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Insoluble</td>
</tr>
<tr>
<td>% Vol. % Wt.</td>
<td></td>
</tr>
</tbody>
</table>

APPEARANCE AND ODOR
Crystal power, aromatic odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAMMABLE (EXPLOSIVE) LIMITS</td>
<td></td>
</tr>
<tr>
<td>FLAMMABLE LIMITS</td>
<td>UPPER</td>
</tr>
<tr>
<td>METHOD USED</td>
<td>LOWER</td>
</tr>
</tbody>
</table>

| METHOD USED           | WATER, FOAM, CARBON DIOXIDE OR DRY CHEMICAL |

SECTION V SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)
PRODUCT DESIGNATION  
P, P-Difluorodiphenyl

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC  no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION  moderate

RELEVANT SYMPTOMS OF EXPOSURE
Serious liver damage, acne, irritation of respiratory passages

EFFECTS OF CHRONIC EXPOSURE
Liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, get medical aid; if swallowed - give emetic, get medical aid; wash skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE  Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR  With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

238-5302B
PRODUCT DESIGNATION
03-238-7302
1,3-Dihydroxy-4-Chlorobenzene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER’S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
4-Chloro Resorcinol

FORMULA
Cl(C₆H₃)(OH)₂

SECTION II HAZARDOUS INGREDIENTS
BASIC MATERIAL

APPROXIMATE
OR MAXIMUM
% WT. OR VOL.

ESTABLISHED
OSHA
STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.

SECTION III PHYSICAL DATA
MW - 144.56

BOILING POINT
256 °C.

VAPOR PRESSURE

mm Hg.

MELTING POINT
107 °C.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (1 = 1)

SOLUBILITY IN WATER
Pt/100 pts H₂O

Soluble

VOLATILE % Vol.

% Wt.

APPEARANCE AND ODOR
White amorphous

SECTION IV FIRE AND EXPLOSION HAZARD DATA
FLASH POINT
None available

METHOD USED

EXTINGUISHING MEDIA
Water, carbon dioxide, dry chemical.

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
13 10:741

238-7302A
PRODUCT DESIGNATION

1,3-Dihydroxy-4-Chlorobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABsORPTION

Inhalation (dust) skin, ingestion

SKIN AND EYE

IRRITATION
Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Hyperemia, itching, dermatitis, restlessness, cyanosis, dizziness, tremors, convulsions and death.

EFFECTS OF CHRONIC EXPOSURE

Possible liver, kidney and lung damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

238-7302B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Dimethylformamide

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 mg/kg

LC50 mg/C.M.

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50 mg/kg</th>
<th>LC50 mg/C.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral-human LD50 500 mg/kg</td>
<td></td>
<td></td>
<td>2800</td>
<td>5000</td>
</tr>
<tr>
<td>Lowest published toxic concentration in air</td>
<td></td>
<td></td>
<td>3750</td>
<td></td>
</tr>
<tr>
<td>Inhalation human 20 PPM</td>
<td></td>
<td></td>
<td>5000</td>
<td>Rabbit</td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

MW: 73.1

BOILING POINT

153°C 291°F

VAPOR PRESSURE

at 25°C

3.7 mm Hg.

MELTING POINT

-61°C 209°F

SPECIFIC GRAVITY (H2O = 1)

0.94

SPECIES CONC.

Rat

Mouse

Rabbit

9400

3.7

2.51

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

136°F

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

15.2%

TOLERATED

2.5%

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

May react with oxidizing materials

239-2453A
PRODUCT DESIGNATION
N,N - Dimethyl Formamide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 10 PPM, 30 mg/C.M.

Carcinogenic NO

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, headache, dizziness, confusion, blood pressure fall, convulsions & coma.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, weakness and irritability

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid; inhalation - give oxygen as needed; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Avoid contact with halogenated hydrocarbons and inorganic nitrates.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles
Mechanical (General)
Gloves
Rubber
Respirator
With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

239-2453B
MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

CHEMICAL FAMILY

TRADE NAME AND SYNONYMS

FORMULA

(CH₃)₂NH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀

ORAL PERCUT. SPECIES CONC.

698 Rat

316 Mouse

240 Rabbit

240 Guinea Pig

SECTION III PHYSICAL DATA

MW - 45.08

BOILING POINT 7°C

MELTING POINT -92°C

SPECIFIC GRAVITY (H₂O = 1) 0.68

VAPOR PRESSURE mm Hg.

VAPOR DENSITY (Air = 1)

EVAPORATION RATE (1 = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O very soluble

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid, fish-like odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 21°F

METHOD USED C.C.

EXTINGUISHING MEDIA Dry chemical carbon dioxide or foam

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER 14.4%

LOWER 2.8%

SPECIAL FIRE FIGHTING PROCEDURES

Stop flow of gas, wear full protective clothing

UNUSUAL FIRE AND EXPLOSION HAZARDS

Vapor forms explosive mixture with air.
PRODUCT DESIGNATION

Dimethylamine anhydrous

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

10 PPM, 18 mg/C.M.

PRINCIPAL ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE CARCINOGENIC no

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE

Bronchitis, pulmonary edema, irritation of eyes, mucous membrane & respiratory tract.

EFFECTS OF CHRONIC EXPOSURE

Liver damage

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - drink water, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATeRIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Put powdered sodium bisulfate on spill, then wash with water.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

MECHANICAL (GENERAL) GLOVES Rubber

SPECIAL RESPIRATOR With proper filter

OTHER PROTECTIVE EQUIPMENT Coveralls

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside or detached storage preferred, store inside in cool, well-ventilated location away from source of ignition.

OTHER PRECAUTIONS

SIGNATURE DATE

239-2703B
PRODUCT DESIGNATION
03-239-2803
Dimethyamine Hydrochloride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Dimethyamine Hydrochloride

FORMULA
(CH₃)₂NH HCl

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
</tbody>
</table>

Note: Lowest published toxic dose
oral - mouse 140 mg/kg.

SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point (°F)</td>
<td>-</td>
</tr>
<tr>
<td>Melting Point (°C)</td>
<td>171</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td></td>
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<tr>
<td>Solubility in Water Pts/100 pts H₂O</td>
<td>369</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless crystal</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point (None available)</td>
<td></td>
</tr>
<tr>
<td>Method Used</td>
<td>Foam, dry chemical, carbon dioxide</td>
</tr>
</tbody>
</table>

SECTION V ADDITIONAL INFORMATION

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

239-2803A
PRODUCT DESIGNATION
Dimethylamine Hydrochloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, inhalation of dust

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Headache, faintness, anxiety, cardiac stimulation, pulmonary edema, skin & eye irritation.

EFFECTS OF CHRONIC EXPOSURE
Cardiac depression

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - drink water, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL) Goggles
SPECIAL

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles Rubber
GLOVES RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

239-2803B
PRODUCT DESIGNATION
03-239-3203
P-Dimethylaminoazobenzene

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
N,N-Dimethyl-4-aminoazobenzene

CHEMICAL NAME AND SYNONYMS
4 dimethylaminoazobenzene

FORMULA
(CH₃)₂NC₆H₄NNC₆H₅

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg ORAL</th>
<th>PERCUT.</th>
<th>LC₅₀ SPECIES</th>
<th>CONC.</th>
</tr>
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<tbody>
<tr>
<td>Notes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Intraperitoneal - mouse LD₁₅₀ 500 mg/kg</td>
<td></td>
<td></td>
<td>200 Rat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Lowest published toxic dose Oral - rat 800 mg/kg - 4 days carcinogen</td>
<td></td>
<td></td>
<td>300 Mouse</td>
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<td></td>
<td></td>
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</tbody>
</table>

SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
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</thead>
<tbody>
<tr>
<td>d</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
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</thead>
<tbody>
<tr>
<td>116</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE (________ = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER</th>
<th>Pts/100 pts H₂O</th>
<th>VOLATILE</th>
<th>% Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insoluble</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow crystal</td>
<td></td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
None available

METHOD USED

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES
Self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(¹ 10.74)
PRODUCT DESIGNATION
P-Dimethylaminoazobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

TERATOGEN

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust, ingestion, skin

CARCINOGENIC
Yes

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin and respiratory system irritant.

EFFECTS OF CHRONIC EXPOSURE
May produce liver cancer, bladder cancer.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - get medical aid;
wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Hazardous Decomposition Products

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Half mask filter type for dust, mist and fumes.

OTHER PROTECTIVE EQUIPMENT
Full body protective clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

239-3203B
PRODUCT DESIGNATION
03-239-5203
Dimethylaniline

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
dimethylphenylamine

CHEMICAL NAME AND SYNONYMS
NN dimethylaniline

FORMULA
C₅H₅N(CH₃)₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
LDLO, oral human 50 mg/kg.

APPROXIMATE
OR MAXIMUM
% WT. OR VOL.

ESTABLISHED
OSHA STANDARD

LD₅₀ mg/kg

LC₅₀

ORAL
1410

PERCUT.

SPECIES
Rat

CONC.
1770

Rabbit

SECTION III PHYSICAL DATA

MW - 121.18

BOILING POINT
193.1 °C

VAPOR PRESSURE
at 29.5 °C

mm Hg.

1

MELTING POINT
2.5 °C

VAPOR DENSITY (Air = 1)

4.17

SPECIFIC GRAVITY (H₂O = 1)

0.9557

EVAPORATION RATE ( )

VOLATILE

% Vol.

% WT.

SOLUBILITY IN WATER

Insoluble

APPEARANCE AND ODOR

Colorless to brown liquid, irritation odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
145 °F

METHOD USED
CC

EXTINGUISHING MEDIA
"Alcohol" foam, water spray, carbon dioxide, dry chemical

FLAMMABLE
EXPLOSIVE)

LIMITS

UPPER

LOWER

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)
PRODUCT DESIGNATION

dimethylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5PPM; 25 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE IRRITATION

Yes

RELEVANT SYMPTOMS OF EXPOSURE
Weakness, tremors, central nervous system depressant, cyanosis, drowsiness

EFFECTS OF CHRONIC EXPOSURE
Fatigue, loss of appetite, headache, dizziness

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Spread a mixture of sand and soda ash (9/1); Transfer to cardboard carton for disposal.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

Coveralls

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE Goggles

GLOVES Rubber

RESPIRATOR With filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

239-5203B
CAS: 000057976

PRODUCT DESIGNATION
03-239-5703
9,10 Dimethyl - 1,2 Benzanthracene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
APPROXIMATE
OR MAXIMUM
% WT. OR VOL.

ESTABLISHED
OSHA
STANDARD

LD50
LC50

ORAL PERCUT. SPECIES CONC.

340 Mouse

Notes:
1. Lowest published toxic dose oral - rat 1.5 mg/kg, cat
2. "" "" skin mouse 0.014 mg/kg/17W car
3. "" "" skin rabbit 12 mg/kg/10W1 ear
4. LD50 intravenous - rat 54 mg/kg

SECTION III PHYSICAL DATA

MW - 256.33

BOILING POINT
-
°F. VAPOR PRESSURE
mm Hg.

MELTING POINT
123°C

SPECIFIC GRAVITY (H2O = 1)

SOLUBILITY IN WATER

Insoluble

APPEARANCE AND ODOR

Greenish yellow crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
none available

METHOD USED

EXTINGUISHING MEDIA
alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS
**PRODUCT DESIGNATION**

9,10 Dimethyl - 1,2, Benzanthracene

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>Teratogen</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>None available</td>
<td></td>
<td>yes</td>
</tr>
</tbody>
</table>

**PRINCIPLE ROUTES OF ABSORPTION**

Inhalation of dust, ingestion, skin

**RELEVANT SYMPTOMS OF EXPOSURE**

Irritation of gastroenteric tract, eyes & skin

**EFFECTS OF CHRONIC EXPOSURE**

Cancer formation in many parts of the body

**EMERGENCY AND FIRST AID PROCEDURES**

Inhalation - rest; if swallowed - get medical aid (gastric lavage); wash from skin & eyes.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</th>
<th>EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical (General)</td>
<td>Goggles</td>
<td></td>
</tr>
<tr>
<td>Special</td>
<td>Gloves</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>Respirator</td>
<td>With proper filter</td>
</tr>
</tbody>
</table>

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

239-5703B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

N,N-Dimethylbenzylamine

FORMULA

(CH₃)NCH₃C₆H₅

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀ % Vol.

ORAL PERCUT. SPECIES CONC.

265 Rat

SECTION III PHYSICAL DATA MW = 135.20

ROILING POINT

184°C

VAPOR PRESSURE

mm Hg.

at 55°C 8

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

0.920

SOLUBILITY IN WATER Pts/100 pts H₂O

SLIGHTLY SOLUBLE

APPEARANCE AND ODOR

LIQUID

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

SPECIAL FIRE FIGHTING PROCEDURES

self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Dimethylbenzylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Headache, cyanosis, drowsiness, mental confusion, convulsions

EFFECTS OF CHRONIC EXPOSURE
Loss of appetite, headache, dizziness, may effect the nervous system.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic; get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

CLOTHES
Rubber

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

239-6203B
**PRODUCT DESIGNATION**
03-239-6403
2,6 Dimethyl-4-Heptanone

**MATERIAL SAFETY DATA SHEET**

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Di-isobutyl, Ketone</td>
<td>((C_2H_9)_2CO)</td>
</tr>
</tbody>
</table>

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD\textsubscript{50} mg/kg</th>
<th>LC\textsubscript{50} ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation human TCLO 50 ppm irritant</td>
<td></td>
<td>1416</td>
<td></td>
</tr>
<tr>
<td>inh-rat LCLO 2000 ppm/4 hr.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>MELTING POINT</th>
<th>SPECIFIC GRAVITY (H\textsubscript{2}O = 1)</th>
<th>SOLUBILITY IN WATER</th>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>168°C 0 F.</td>
<td>-46°C 0 F.</td>
<td>0.81</td>
<td>Low</td>
<td>Colorless oil, methol-like odor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VAPOR PRESSURE</th>
<th>VAPOR DENSITY (Air = 1)</th>
<th>EVAPORATION RATE ( 1)</th>
<th>VOLATILE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>at 15°C</td>
<td></td>
<td></td>
<td>% Vol.</td>
<td>% Wt.</td>
</tr>
</tbody>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>140°F</td>
<td>6.2%</td>
<td>0.8%</td>
<td></td>
</tr>
</tbody>
</table>

**METHOD USED**
Open Cup

**EXTINGUISHING MEDIA**
Carbon dioxide, dry chemical

**UNUSUAL FIRE AND EXPLOSION HAZARDS**
PRODUCT DESIGNATION
2,6 - Dimethyl - 4 - Heptanone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 25 PPM, 150 mg/C.M.

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION mild

RELEVANT SYMPTOMS OF EXPOSURE
Nausea, dizziness, narcotic effect

EFFECTS OF CHRONIC EXPOSURE
Liver damage, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - get medical aid; inhalation - give oxygen if needed; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towels, evaporate on glass in hood.

WASTE DISPOSAL METHOD
Burn in furnace.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL
RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
Overalls

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Do not store in direct sunlight, keep away from sources of ignition and oxidizing materials.

OTHER PRECAUTIONS

SIGNATURE
DATE

236-6403B
### SECTION I  SOURCE AND NOMENCLATURE

**MANUFACTURER'S NAME**  

**EMERGENCY TELEPHONE NO.**

**ADDRESS** (NUMBER, STREET, CITY, STATE, ZIP CODE)

**TRADE NAME AND SYNONYMS**

**FORMULA**

5,5 Dimethyl - 1, 3 Cyclohexanedione \((\text{CH}_3)_2\text{C}_6\text{H}_4\text{O}_2\)

### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50})</th>
<th>LC(_{50})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL PERCUT. SPECIES CONC.</td>
<td>none available</td>
</tr>
</tbody>
</table>

### SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>149°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>0°F</td>
</tr>
<tr>
<td>Specific Gravity ((\text{H}_2\text{O} = 1))</td>
<td>1.49</td>
</tr>
<tr>
<td>Solubility in Water (\text{g} / 100 \text{g} \text{H}_2\text{O})</td>
<td>0.42</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Yellow crystals</td>
</tr>
</tbody>
</table>

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

**Flash Point**  
None available

**Method Used**  
Alcohol foam, carbon dioxide, dry chemical

**Extinguishing Media**

**Unusual Fire and Explosion Hazards**

---

UCN-11322  
(3 10.74)
PRODUCT DESIGNATION

dimethyldihydroresorcinol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

NO

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust, ingestion, skin

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Headache, eye & upper respiratory irritation;

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - induce vomiting,

get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

239-6703B
PRODUCT DESIGNATION
03-240-0304
2,4 - Dimethylphenacyl chloride

MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
α chloro-2,4 dimethyl acetophenone

FORMULA
ClCH₂CO₂H₂₅(CH₃)

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL PERCUT. SPECIES CONC.
none available

SECTION III PHYSICAL DATA

MW - 182.65

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

62° C

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE

SPECIES

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE % Vol.

% Wt.

APPEARANCE AND ODOR

Needle-like crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Not available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

May react with water or steam to produce toxic and corrosive fumes.

UCN-11322
240-0304A
(3 10-74)
SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC  NO

PRINCIPLE ROUTES OF ABSORPTION
- Inhalation of dust, ingestion

SKIN AND EYE IRRITATION  moderate

RELEVANT SYMPTOMS OF EXPOSURE  Eye irritation, corneal haziness & pain; burning of throat and eyes; skin irritation.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; treat for pulmonary edema; if swallowed - give emetic, get medical aid; wash from skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

MECHANICAL (GENERAL)

GLOVES Rubber

SPECIAL RESPIRATOR Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE  DATE

240-0304B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

α, γ - Lupetidine

α, γ - Lupetidine

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

MW = 113.20

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>139 °C</td>
</tr>
<tr>
<td>Melting Point</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>0.845</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Pis/100 pts H₂O</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Liquid</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>None available</td>
</tr>
<tr>
<td>Method Used</td>
<td>Alcohol foam, carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
2,4 Dimethylpiperidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Increased blood pressure, weakness, nausea, vomiting, salivation, asphyxia, corneal damage.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, ocular and facial paralysis -

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting then gastric lavage; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

240-1404B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMCS

CHEMICAL NAME AND SYNONYMCS

FORMULA

2 Methyl-2-Pentanol

(CH₃)₂COH(CH₂)₂CH₃

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀

LC₅₀

ORAL

PERCUT.

SPECIES

CONC.

None available

SECTION III PHYSICAL DATA

BOILING POINT

°F.

VAPOR PRESSURE

mm Hg.

123°C

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

-108°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE ( ) = 1

0.81

SOLUBILITY IN WATER

% Vol.

% Wt.

Slightly soluble

APPEARANCE AND ODOR

Clear liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

240-1804A
PRODUCT DESIGNATION
Dimethyl-N-Propylcarbinol

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION
moderate

RELEVANT SYMPTOMS OF EXPOSURE
Eye, nose & throat irritation; narcosis, ingestion, headache, dizziness, nausea, vomiting, diarrhea, delirium, coma

EFFECTS OF CHRONIC EXPOSURE
Possible liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - give oxygen as needed; ingestion - induce vomiting, get medical aid; wash from skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE  DATE

240-1804B
PRODUCT DESIGNATION
03-246-6708
4,4-Dibromodiphenyl Ether

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
P,P-Dibromodiphenyl ether

CHEMICAL FAMILY

FORMULA
(\text{BrC}_2\text{H}_4\text{O})

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD_{50} ORAL PERCUT.

LC_{50} SPECIES CONC.

Lowest published lethal dose
intra peritoneal - mouse 125 mg/kg.

SECTION III PHYSICAL DATA

MW - 328.02

Boiling Point
340°C

Melting Point
60°C

Specific Gravity \((\text{H}_2\text{O} = 1)\)

Solubility in Water

very soluble

Appearance and Odor
crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE (EXPLOSIVE) LIMITS

Flash Point
none available

Method Used

Extinguishing Media
water alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION

4,4-Dibromodiphenyl Ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

Carcinogenic no

PRINCIPAL ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE IRITATION yes

RELEVANT SYMPTOMS OF EXPOSURE

loss of appetite, nausea

EFFECTS OF CHRONIC EXPOSURE

liver, spleen, kidney and thyroid damage

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid; wash skin & eyes; inhalation - give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

May react with oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

goggles

SPECIAL

gloves rubber

OTHER PROTECTIVE EQUIPMENT

RESPIRATOR

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

246-6708B
**PRODUCT DESIGNATION**

β, β’ Dichlorodiethyl Ether
03-246-6908

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER’S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CHEMICAL NAME AND SYNONYMS**

Bis(2-Chloroethyl) Ether

**FORMULA**

ClCH₂CH₂OCH₂CH₂Cl

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDLO - oral - human</td>
<td>50 mg/kg</td>
<td></td>
<td>75 Rat</td>
<td>300 Guinea Pig</td>
</tr>
</tbody>
</table>

**SECTION III PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F</th>
<th>VAPOR PRESSURE</th>
<th>20°C</th>
<th>0.7 mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>178.5°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-51.7°C</td>
<td></td>
<td>4.93</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>1.222</th>
<th>20°/20°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H₂O</td>
<td>VOLATILE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorless, stable liquid, pungent odor.</td>
</tr>
</tbody>
</table>

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>131°F</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>EXTINGUISHING MEDIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed Cup</td>
<td>Dry chemical, foam, or carbon dioxide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
<th>UNUSUAL FIRE AND EXPLOSION HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear self-contained breathing apparatus.</td>
<td>May flash back.</td>
</tr>
</tbody>
</table>

**UNCN-11322**

246-6908A
PRODUCT DESIGNATION

8,8' Dichlorodiethyl Ether (Skin)

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 5 ppm, 30 mg/C.M.

EXPERIMENTAL CARCINOGEN

ORAL MOUSE

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of vapor, absorption through skin

SKIN AND EYE IRRITATION Mild

RELEVANT SYMPTOMS OF EXPOSURE Nausea, coughing, retching and irritation of conjunctiva and mucous membranes.

EFFECTS OF CHRONIC EXPOSURE Central nervous system depression

EMERGENCY AND FIRST AID PROCEDURES Give artificial respiration, remove contaminated clothing (do not give stimulants). Obtain medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Absorb with paper towels, evaporate from towel in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

Self-contained breathing apparatus

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

GLOVES Rubber

RESPIRATOR

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Store in well-ventilated area.

OTHER PRECAUTIONS

SIGNATURE      DATE

246-6908B
MATERIAL SAFETY DATA SHEET

SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Bis(chloromethyl)ether

FORMULA

(CICH₂)₂O

SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀ mg/C.M.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rat</td>
<td>210</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mouse</td>
<td>280</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rabbit</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III  PHYSICAL DATA

MW = 114.96

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>°F.</th>
<th>VAPOR PRESSURE</th>
<th>mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>104°C.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MELTING POINT</th>
<th>°F.</th>
<th>VAPOR DENSITY (Air = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>4.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIFIC GRAVITY (H₂O = 1)</th>
<th>EVAPORATION RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.33</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOLUBILITY IN WATER (Pis/100 pis H₂O)</th>
<th>VOLATILE % Vol.</th>
<th>% Wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Decomposes

APPEARANCE AND ODOR

Colorless liquid

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

METHOD USED

EXTINGUISHING MEDIA

Water may be used to blanket fire.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

246-7608A
PRODUCT DESIGNATION

S-Dichloromethyl Ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

1 PRA

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE

Respiratory and eye irritation, skin cancer.

EFFECTS OF CHRONIC EXPOSURE

Lung cancer.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid; inhalation - rest; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

Full protective clothing.

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE

Goggles

GLOVES

Rubber

RESPIRATOR

Full face self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

246-7806B
### SECTION I  SOURCE AND NOMENCLATURE

**MANUFACTURER'S NAME**

**EMERGENCY TELEPHONE NO.**

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

- Butyl Cellosolve

**CHEMICAL NAME AND SYNONYMS**

- 2 Butoxy ethanol

**CHEMICAL FAMILY**

**FORMULA**

\( \text{C}_4\text{H}_9\text{OCH}_2\text{CH}_3\text{OH} \)

### SECTION II  HAZARDOUS INGREDIENTS

#### BASIC MATERIAL

<table>
<thead>
<tr>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) mg/kg</th>
<th>LC(_{50}) PPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowest published toxic concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCLO in air - inhalation - human</td>
<td>195 PPM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION III  PHYSICAL DATA

**MW - 118.17**

<table>
<thead>
<tr>
<th><strong>BOILING POINT</strong></th>
<th><strong>°F.</strong></th>
<th><strong>VAPOR PRESSURE at 20°C</strong></th>
<th><strong>0.6 mm Hg.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>171°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>MELTING POINT</strong></th>
<th><strong>°F.</strong></th>
<th><strong>VAPOR DENSITY (Air = 1)</strong></th>
<th><strong>4.07</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>-40°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>SPECIFIC GRAVITY (H(_2)O = 1)</strong></th>
<th><strong>0.90</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>SOLUBILITY IN WATER</strong></th>
<th><strong>Pts/100 pts H(_2)O</strong></th>
<th><strong>very soluble</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>APPEARANCE AND ODOR</strong></th>
<th><strong>colorless liquid</strong></th>
</tr>
</thead>
</table>

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th><strong>FLASH POINT</strong></th>
<th><strong>°F.</strong></th>
<th><strong>FLAMMABLE (EXPLOSIVE) LIMITS</strong></th>
<th><strong>UPPER</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>141°F</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>EXTINGUISHING MEDIA</strong></th>
<th><strong>carbon dioxide, dry chemical, water</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>SPECIAL FIRE FIGHTING PROCEDURES</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>UNUSUAL FIRE AND EXPLOSION HAZARDS</strong></th>
</tr>
</thead>
</table>
**PRODUCT DESIGNATION**
Ethylene Glycol Monobutyl Ether

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**
TLV - 50 PPM, 240 mg/C.M. skin

**CARCINOGENIC**
no

**PRINCIPLE ROUTES OF ABSORPTION**
Inhalation of mist, ingestion, skin

**SKIN AND EYE IRRITATION**
severe

**RELEVANT SYMPTOMS OF EXPOSURE**
Respiratory & eye irritation, narcosis, lung congestion

**EFFECTS OF CHRONIC EXPOSURE**
Lung, liver and kidney damage, anemia

**EMERGENCY AND FIRST AID PROCEDURES**
If swallowed - give emetic, get medical aid; wash eyes and skin; inhalation - give oxygen as necessary.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**
May react with oxidizing materials

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**
Absorb on paper towel; evaporate in hood.

**WASTE DISPOSAL METHOD**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

**PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE**
Goggles

**MECHANICAL (GENERAL)**

**GLOVES**
Rubber

**SPECIAL**

**RESPIRATORY**

**OTHER PROTECTIVE EQUIPMENT**
Protective clothing

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

247-0909B
**PRODUCT DESIGNATION**

03-247-1209
Ethylene Glycolmonoethyl Ether

---

**SECTION I SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE):**

**TRADE NAME AND SYNONYMS:**

2 Ethoxyethanol

**CHEMICAL NAME AND SYNONYMS:**

Cellosolve

**CHEMICAL FAMILY:**

**FORMULA:**

\[ \text{C}_2\text{H}_5\text{OCH}_2\text{CH}_2\text{OH} \]

---

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD(_{50}) mg/kg</th>
<th>LC(_{50}) PPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDLO - oral - human</td>
<td>500 mg/kg</td>
<td></td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td>Note: Lowest published lethal concentration in air</td>
<td></td>
<td></td>
<td>4310</td>
<td>1820</td>
</tr>
<tr>
<td>inhalation - rat 4000 PPM - 4 hours</td>
<td></td>
<td></td>
<td>3100 3500</td>
<td>rabbit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1400</td>
<td>guinea pig</td>
</tr>
</tbody>
</table>

**LDLO** - oral - human

**LC\(_{50}\)** - oral - rat

**LC\(_{50}\)** - percutaneous - mouse

**SECTION III PHYSICAL DATA**

| MW - 90.12 |

**BOILING POINT**

135\(^\circ\)C 275\(^\circ\)F

**MELTING POINT**

0\(^\circ\)F

**VAPOR PRESSURE**

20\(^\circ\)C 3.8 mm Hg.

**VAPOR DENSITY (AIR = 1)**

3.10

**SPECIFIC GRAVITY (H\(_2\)O = 1)**

0.94

**SOLUBILITY IN WATER**

very soluble

**APPEARANCE AND ODOR**

colorless liquid, practically odorless

---

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

**FLASH POINT**

202\(^\circ\)F

**METHOD USED**

alcohol foam, carbon dioxide, dry chemical, water

**FLAMMABLE (EXPLOSIVE) LIMITS**

<table>
<thead>
<tr>
<th>UPPER</th>
<th>LOWER</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.7%</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

**EXTINGUISHING MEDIA**

alcohol foam, carbon dioxide, dry chemical, water

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

moderate explosion hazard in vapor foam.
PRODUCT DESIGNATION

Ethylene glycol monoethyl ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 100 PPM, 370 mg/C.M., skin

Carcinogenic No

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE

congestion and edema of the lungs.

EFFECTS OF CHRONIC EXPOSURE

Kidney damage, albumin in urine, loss of appetite.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic; get medical aid; wash eyes and skin; inhalation - give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Absorb on paper towels; evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

- goggles

MECHANICAL (GENERAL)

- gloves

SPECIAL

- rubber

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

247-1209B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

LD₅₀ mg/kg

LC₅₀ PPM

ESTABLISHED OSHA STANDARD

ORAL PERCUT. SPECIES CONC.

2 methoxyethanol

Methyl cellosolve

Note: Lowest published toxic concentration in air (890) inhalation - human 25 PPM central nervous system

lowest published lethal dose human - 3380 mg/Kg.

lowest published lethal concentration in air

inhalation - rat 2000 PPM - 4 hours

SECTION III PHYSICAL DATA

MW - 76.09

BOILING POINT 0 F.

125°C 212°F

VAPOR PRESSURE mm Hg.
at 20°C 6.2

MELTING POINT 0 F.

-87°C - 125.6°F

VAPOR DENSITY (Air = 1)

2.62

SPECIFIC GRAVITY (H₂O = 1)

0.97

EVAPORATION RATE ( = 1)

VOLATILE % Vol. % Wt.

ever soluble

colorless liquid, mild agreeable odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 0 F.

115°F 45.9°C

METHOD USED

O.C.

EXTINGUISHING MEDIA

Alcohol foam, dry chemical, carbon dioxide

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

247-1509A
PRODUCT DESIGNATION
Ethylene Glycol Monomethyl Ether

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
TLV-25 PPM, 80 mg/C.M. skin

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
lung edema, narcotic action

EFFECTS OF CHRONIC EXPOSURE
Blood, liver, kidney damage, headache, drowsiness, burning of eyes, anemia

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; wash eyes & skin; inhalation - give oxygen as needed.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) RYP, gloves
MECHANICAL (GENERAL) GLOVES rubber
SPECIAL RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

247-1509B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Chemical Name and Synonyms

SECTION II HAZARDOUS INGREDIENTS

Basic Material

Approximate or Maximum % WT. OR VOL.

Established OSHA Standard

LDso mg/kg

LCso

SECTION III PHYSICAL DATA

Boiling Point

Melting Point

Specific Gravity

Solubility in Water

Appearance and Odor

Colorless crystals, geranium odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flammable Limits

Extinguishing Media

Water, alcohol foam, carbon dioxide, dry chemical

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards
PRODUCT DESIGNATION
Phenyl Ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 1 PPM, 7 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
nausea, loss of appetite

EFFECTS OF CHRONIC EXPOSURE
liver spleen; kidney and thyroid damage

EMERGENCY AND FIRST AID PROCEDURES
if swallowed - give emetic, get medical aid; wash skin and eyes; inhalation - give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
may react with oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL

PROTECTIVE EQUIPMENT (SPECIFY TYPE)
EYE
Goggles
Gloves
Rubber
Respirator

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE
DATE

247-5809B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Diisopropyl ether

FORMULA

\((C_3H_7)_2O\)

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀

ORAL PERCUT. SPECIES CONC.

---

8470 Rat

20,000 Rabbit

SECTION III PHYSICAL DATA

MW = 102.17

BOILING POINT

°F.

68.5

VAPOR PRESSURE

mm Hg.

150

MELTING POINT

°F.

-60

VAPOR DENSITY (AIR = 1)

3.52

SPECIFIC GRAVITY (H₂O = 1)

0.72

EVAPORATION RATE (--- = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

slightly soluble

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

colorless liquid, ethereal odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

-18°F.

FLAMMABLE (EXPLOSIVE) LIMITS

FLAMMABLE UPPER 7.9%

LOWER 1.4%

METHOD USED

C.C.

EXTINGUISHING MEDIA

alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

247-6209A
PRODUCT DESIGNATION
Iso-propyl ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
T1V - 250 PPM, 1050 mg/C.M.

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION
moderate

RELEVANT SYMPTOMS OF EXPOSURE
anesthesia action, irritating to mucous membranes, headache, nausea, vomiting.

EFFECTS OF CHRONIC EXPOSURE
dermatitis, headache, nausea, depressed appetite.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; wash skin & eyes; inhalation - give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
reacts with oxygen to produce explosive peroxides.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towels, evaporate in hood.

WASTE DISPOSAL METHOD
Dissolve in benzene and burn.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

yoggles

MECHANICAL (GENERAL)

GLOVES
rubber

SPECIAL

RESPIRATOR
chemical cartridge type

OTHER PROTECTIVE EQUIPMENT
Coveralls

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
detached outside storage preferred. For inside storage - standard flammable liquids room or storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

247-6209B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

M-Methoxyphenol

CHEMICAL FAMILY

FORMULA

CH₃O-C₆H₄OH

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED

LD₅₀

LC₅₀

OSHA STANDARDS

ORAL PERCUT. SPECIES CONC.

none available

SECTION III PHYSICAL DATA

MW - 124.13

BOILING POINT

244°C 0°F

VAPOR PRESSURE

at 115°C

5 mm Hg.

MELTING POINT

-17°C 0°F

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

> 1

EVAPORATION RATE ( ) = 1

SPECIES

VOLATILE

% Vol.

% WT.

SOLUBILITY IN WATER Pts/100 pts H₂O

slightly soluble

APPEARANCE AND ODOR

liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

METHOD USED

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

EXTINGUISHING MEDIA

carbon dioxide, alcohol foam, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

247-6709A
PRODUCT DESIGNATION
Resorcinol monomethyl ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION
moderate

RELEVANT SYMPTOMS OF EXPOSURE
hyperemia, itching, dermatitis, restlessness, cyanosis,
dizziness, tremors, convulsions, death.

EFFECTS OF CHRONIC EXPOSURE
Possible liver, kidney and lung damage

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid;
wash eyes & skin; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Safety goggles

MECHANICAL (GENERAL)

GLOVES
rubber

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

247-6709B
PRODUCT DESIGNATION

03-249-1601
β - Ethoxyethyl acetate

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

Cellosolve acetate

CHEMICAL NAME AND SYNONYMS

2 Ethoxyethyl Acetate

FORMULA

C\textsubscript{2}H\textsubscript{5}OCH\textsubscript{2}CH\textsubscript{2}OOCH\textsubscript{4}

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD\textsubscript{50} mg/kg</th>
<th>LC\textsubscript{50}</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDLO - oral - human</td>
<td>500 mg/kg</td>
<td></td>
<td>1910</td>
<td>guinea pig</td>
</tr>
<tr>
<td>lowest published lethal</td>
<td></td>
<td></td>
<td>5100</td>
<td>rat</td>
</tr>
<tr>
<td>concentration in air</td>
<td></td>
<td></td>
<td>15,500</td>
<td>rabbit</td>
</tr>
<tr>
<td>inhalation - rat</td>
<td>1500 PPM</td>
<td></td>
<td>1910</td>
<td>guinea pig</td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

MW - 132.17

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point (^\circ)F</td>
<td>156 (^\circ)C</td>
</tr>
<tr>
<td>Melting Point (^\circ)F</td>
<td>-62 (^\circ)C</td>
</tr>
<tr>
<td>Vapor Pressure at 20 (^\circ)C mm Hg</td>
<td>1.2</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>4.72</td>
</tr>
<tr>
<td>Specific Gravity (H\textsubscript{2}O = 1)</td>
<td>0.97</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Soluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid, pleasant odor, bitter taste.</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point (^\circ)F</td>
<td>120</td>
</tr>
<tr>
<td>Method Used</td>
<td>COC</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Alcohol foam, carbon dioxide, dry chemical</td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td></td>
</tr>
</tbody>
</table>

UCN-11322
(3 10-74)


**PRODUCT DESIGNATION**

β Ethoxyethyl acetate

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**

TLV - 100 PPM, 540 mg/C.M. (skin)

**CARCINOGENIC**

No

**PRINCIPAL ROUTES OF ABSORPTION**

Inhalation, ingestion, skin

**SKIN AND EYE IRRITATION**

Slightly

**RELEVANT SYMPTOMS OF EXPOSURE**

Restlessness, drowsiness, coma, irritation of eyes & nose.

**EFFECTS OF CHRONIC EXPOSURE**

Kidney injury

**EMERGENCY AND FIRST AID PROCEDURES**

If swallowed - give emetic, get medical aid; inhalation - rest; wash from eyes and skin.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Waste disposal method

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

**PROTECTIVE EQUIPMENT (SPECIFY TYPES)**

Eye goggles

Mechanical (general)

Gloves rubber

SPECIAL RESPIRATOR

**OTHER PROTECTIVE EQUIPMENT**

**SECTION IX SPECIAL PRECAUTIONS**

Precautions to be taken in handling and storage

Other precautions

**SIGNATURE**

**DATE**

249-1601B
PRODUCT DESIGNATION
03-249-6601
Ethylamine, anhydrous

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
monoethylamine

CHEMICAL NAME AND SYNONYMS
aminoethane

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 mg/kg

LC50

ORAL PERCUT. SPECIES CONC.

390 rabbit

Lowest published lethal dose
oral - rat - 400 mg/kg
lowest published lethal concentration in air
inhalation - rat 3000 PPM - 4 hours.

SECTION III PHYSICAL DATA

MW - 45.10

BOILING POINT 0 F.

16.6 C

MELTING POINT 0 F.

-80.6 C

SPECIFIC GRAVITY (H2O = 1)

0.8

SPECIFIC CONC. (H2O = 1)

1.56

SPECIFIC VAPOR DENSITY (Air = 1)

EVAPORATION RATE

VOLATILE % Vol.

% Wt.

Ininitely soluble

APPEARANCE AND ODOR

colorless liquid, strong ammonical odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT < 0

METHOD USED

EXTINGUISHING MEDIA

alcohol foam, carbon dioxide, dry chemical.

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER 14.0 %

LOWER 3.5 %

SPECIAL FIRE FIGHTING PROCEDURES

water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Ethylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
10 PPM, 18 mg/C.M.

CARCINOGENIC
NO

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION
severe

RELEVANT SYMPTOMS OF EXPOSURE
eye irritation, mucous membrane and respiratory system irritation.

EFFECTS OF CHRONIC EXPOSURE
lung, liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, get medical aid; if swallowed - drink water, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Cover with sodium bisulfate, add water.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)
safety goggles

GLOVES
rubber (butyl)

RESPIRATOR
with proper filter

SPECIAL

OTHER PROTECTIVE EQUIPMENT
Coveralls

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Attached or outside storage preferred; inside storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

D.A.T.F.

249-6601B
# Material Safety Data Sheet

## Section I: Source and Nomenclature

**Manufacturer's Name**

**Emergency Telephone No.**

**Address (Number, Street, City, State, Zip Code):**

**Trade Name and Synonyms**

- Ethyl ammonium chloride

**Chemical Name and Synonyms**

- Aminoethane hydrochloride

**Chemical Family**

**Formula**

\[ \text{C}_2\text{H}_5\text{NH}_2\text{HCl} \]

## Section II: Hazardous Ingredients

### Basic Material

| Unclassified - Rat LDLo | 2500 mg/kg |

### Approximate LD50

| Oral | Percut. |

| Limit |

| MW - 81.56 |

## Section III: Physical Data

| Boiling Point | 16.6°C |
| Melting Point | -80.6°C |
| Specific Gravity (H2O = 1) | 0.8 |
| Solubility in Water as Pts/100 Pts H2O | Infinitely soluble |

### Appearance and Odor

- Colorless liquid, strong ammonical odor

## Section IV: Fire and Explosion Hazard Data

### Flash Point

\(<0°F\)

### Method Used

- Alcohol foam, carbon dioxide, dry chemical

### Extinguishing Media

- Alcohol foam, carbon dioxide, dry chemical

### Special Fire Fighting Procedures

- Water may be ineffective

### Initial Fire and Explosion Hazards

---

**UCN-11322**

(3 10-74)

**249-6701A**
PRODUCT DESIGNATION
Ethylamine hydrochloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE
eye irritation, mucous membrane and respiratory system irritation

EFFECTS OF CHRONIC EXPOSURE
Lung, liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, get medical aid; if swallowed - drink water, get medical aid; wash eyes and skin.

SECTION VI REACTIVITY DATA

SECTION VII SPILL OR LEAK PROCEDURES

SECTION VIII SPECIAL PROTECTION INFORMATION

SECTION IX SPECIAL PRECAUTIONS

OTHER PRECAUTIONS

SIGNATURE DATE

249-6701B
PRODUCT DESIGNATION
03-249-7101
N-Ethylaniline

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
Ethylphenylamine
FORMULA
C₆H₅NHCH₃

SECTION II HAZARDOUS INGREDIENTS
BASIC MATERIAL
APPROXIMATE OR MAXIMUM
% WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD₅₀ mg/kg

LC₅₀ CONC.

ORAL PERCUT. SPECIES CONC.

334 rat
4700 rabbit

SECTION III PHYSICAL DATA
MW = 121.20

BOILING POINT
°F.
204°C  1 mm Hg.

MELTING POINT
°F.
-64°C

SPECIFIC GRAVITY (H₂O = 1)
0.96

VAPOR DENSITY (Air = 1)
4.18

SPECIFIC GRAVITY IN VAPOR DENSITY (Air = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE % Vol.
% Wt.

APPEARANCE AND ODOR
clear, yellow brown oil

SECTION IV FIRE AND EXPLOSION HAZARD DATA
FLASH POINT
°F.
185°F

METHOD USED
O.C.

EXTINGUISHING MEDIA
Foam, carbon dioxide, dry chemical

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER

LOWER

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
When heated may decompose to give toxic aniline fumes.
PRODUCT DESIGNATION
N Ethylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

Carcinogenic

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE weakness, tremors, cyanosis, drowsiness, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE
Fatigue, loss of appetite, headache, dizziness

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

mechanical (general)

GOGGLES

special

Polyvinyl alcohol

OTHER PROTECTIVE EQUIPMENT

RESPIRATOR with proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

249-7101B
### SECTION I SOURCE AND NOMENCLATURE

**MANUFACTURER'S NAME**

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS**

*Phenyl Ethane*

**CHEMICAL FAMILY**

*C_{6}H_{5}C_{2}H_{5}*

---

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LDso mg/kg</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL PERCUT. SPECIES</td>
<td>CONC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rat</td>
<td>5000</td>
</tr>
<tr>
<td>#1 lowest published toxic dose</td>
<td></td>
<td></td>
<td>rabbit</td>
<td>3500</td>
</tr>
<tr>
<td>ocular - human</td>
<td>200 PPM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCLO - inhalation - human</td>
<td>100 PPM/8 hr</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### SECTION III PHYSICAL DATA

**MW = 106.16**

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>136.2°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-95°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>0.86</td>
</tr>
<tr>
<td>Solubility in Water (pts/100 pts H₂O)</td>
<td>No</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid with aromatic odor</td>
</tr>
</tbody>
</table>

---

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

**Flash Point**

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>TEMPERATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>59°F</td>
</tr>
</tbody>
</table>

**Flammable (Explosive) Limits**

<table>
<thead>
<tr>
<th>CONCENTRATION</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>6.7%</td>
</tr>
<tr>
<td>Lower</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

**Extinguishing Media**

- Water spray, carbon dioxide, dry chemical or foam.

**Special Fire Fighting Procedures**

- Water may be ineffective. Wear goggles and self-contained breathing apparatus.

---

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

---

**CAS: 0001004L4**

**PRODUCT DESIGNATION**

03-249-8601

*Ethylbenzene*

---

**SOURCE**

**AND NOMENCLATURE**

**MANUFACTURER'S NAME**

**EMERGENCY TELEPHONE NO.**

---

**SECTION II HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LDso mg/kg</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL PERCUT. SPECIES</td>
<td>CONC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rat</td>
<td>5000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rabbit</td>
<td>3500</td>
</tr>
</tbody>
</table>

---

**SECTION III PHYSICAL DATA**

**MW = 106.16**

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>136.2°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-95°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>0.86</td>
</tr>
<tr>
<td>Solubility in Water (pts/100 pts H₂O)</td>
<td>No</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid with aromatic odor</td>
</tr>
</tbody>
</table>

---

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>INGREDIENT</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LDso mg/kg</th>
<th>LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL PERCUT. SPECIES</td>
<td>CONC.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rat</td>
<td>5000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>rabbit</td>
<td>3500</td>
</tr>
</tbody>
</table>

---

**EXTINGUISHING MEDIA**

- Water spray, carbon dioxide, dry chemical or foam.

**SPECIAL FIRE FIGHTING PROCEDURES**

- Water may be ineffective. Wear goggles and self-contained breathing apparatus.
PRODUCT DESIGNATION
Ethyl benzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 100 PPM, 435 mg/C.M.

CARCINOGENIC
No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION
Severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye, skin & respiratory irritation, dizziness

EFFECTS OF CHRONIC EXPOSURE
May have some effect on liver, kidneys and blood

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towels; evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Safety glasses

GLOVES

Rubber

RESPIRATOR
Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside or detached storage preferred, indoor storage in flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

249-8601B
**SECTION I**  
**SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylbenzylphenylamine</td>
<td>C₆H₅N(C₆H₅)CH₂C₆H₅</td>
</tr>
</tbody>
</table>

**SECTION II**  
**HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SPECIES</td>
<td>CONC.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COMPOUND</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>none available</td>
<td>none available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION III**  
**PHYSICAL DATA**

<table>
<thead>
<tr>
<th>BOILING POINT</th>
<th>286°F</th>
<th>VAPOR PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>mm Hg</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td></td>
<td>VAPOR DENSITY (Air = 1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.28</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H₂O = 1)</td>
<td></td>
<td>EVAPORATION RATE (L/min)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.03</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 pts H₂O</td>
<td>VOLATILE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% Vol.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% Wt.</td>
</tr>
</tbody>
</table>

| APPEARANCE AND ODOR | clear colorless oil |

**SECTION IV**  
**FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>none available</th>
</tr>
</thead>
</table>

| EXTINGUISHING MEDIA | foam, carbon dioxide, dry chemical |

| SPECIAL FIRE FIGHTING PROCEDURES | |

| UNUSUAL FIRE AND EXPLOSION HAZARDS | when heated may decompose to give off toxic aniline fumes. |

UCN-11322  
(3 10-74)  
250-0202A
### Section V: Health Hazard Data

**Toxic Level**
- None available

**Principle Routes of Absorption**
- Inhalation, ingestion, skin

**Skin and Eye Irritation**
- Moderate

**Relevant Symptoms of Exposure**
- Weakness, tremors, cyanosis, drowsiness, central nervous system depression

**Effects of Chronic Exposure**
- Fatigue, loss of appetite, headache, dizziness

**Emergency and First Aid Procedures**
- Inhalation - rest; if swallowed - give emetic, get medical aid; wash from skin & eyes.

### Section VI: Reactivity Data

**Conditions Contributing to Instability**

**Conditions Contributing to Hazardous Polymerization**

**Incompatibility (Materials to Avoid)**

**Hazardous Decomposition Products**

### Section VII: Spill or Leak Procedures

**Steps to be Taken in Case Material is Released or Spilled**

### Section VIII: Special Protection Information

<table>
<thead>
<tr>
<th>Ventilation Requirements Local Exhaust</th>
<th>Protective Equipment (Specify Types)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eye goggles</td>
</tr>
<tr>
<td></td>
<td>Mechanical (General)</td>
</tr>
<tr>
<td></td>
<td>Gloves polyvinyl alcohol</td>
</tr>
<tr>
<td></td>
<td>Special respirator with proper filter</td>
</tr>
</tbody>
</table>

### Section IX: Special Precautions

**Precautions to be Taken in Handling and Storage**

**Other Precautions**

**Signature**

**Date**

250-0202B
# Material Safety Data Sheet

## PRODUCT DESIGNATION
03-250-0702  
Ethyl Bromide

## SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromoethane</td>
<td>C₂H₅Br</td>
</tr>
</tbody>
</table>

## SECTION II  HAZARDOUS INGREDIENTS

### LC₅₀ Inhalation
- Rat: 149,000 PPM - 15 min.
- Guinea Pig: 3,200 PPM/9 hrs.

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀ PPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCKO inhalation</td>
<td>149,000 PPM - 15 min.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LCKO</td>
<td>guinea pig: 3,200 PPM/9 hrs.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>38.4°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-119°C</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.45</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>0.91</td>
</tr>
</tbody>
</table>

**Appearance and Odor**: Colorless, volatile liquid, ether-like odor.

## SECTION IV  FIRE AND EXPLOSION HAZARD DATA

### Flash Point
- Method Used  

<table>
<thead>
<tr>
<th>POINT</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Extinguishing Media**: Water, carbon dioxide, dry chemical

**Special Fire Fighting Procedures**: <-4°F.

**Unusual Fire and Explosion Hazards**: 

---

UCN-11322  
(3 10-74)
**PRODUCT DESIGNATION**

Ethyl Bromide

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**

TLV - 200 PPM, 890 mg/C.M.

**Carcinogenic** no

**Principal Routes of Absorption**

Inhalation, ingestion

**Skin and Eye Irritation** moderate

**Relevant Symptoms of Exposure**

Central nervous system depression, irritation of respiratory system.

**Efects of Chronic Exposure**

Possible liver and kidney damage.

**Emergency and First Aid Procedures**

Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash from eyes & skin.

**SECTION VI REACTIVITY DATA**

**Conditions Contributing to Instability**

**Conditions Contributing to Hazardous Polymerization**

**Incompatibility (Materials to Avoid)**

**Hazardous Decomposition Products**

**SECTION VII SPILL OR LEAK PROCEDURES**

Steps to be taken in case material is released or spilled

Absorb on paper towels, evaporate in hood.

**Waste Disposal Method**

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

**PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE**

Goggles

**MECHANICAL (GENERAL)**

**GLOVES**

Rubber

**SPECIAL**

**RESPIRATOR**

Self-contained breathing apparatus

**OTHER PROTECTIVE EQUIPMENT**

Overalls

**SECTION IX SPECIAL PRECAUTIONS**

**Precautions to be Taken in Handling and Storage**

Outside or detached storage preferred, inside storage in flammable liquids storage cabinet.

**OTHER PRECAUTIONS**

**SIGNATURE**

**DATE**

250-0702B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

- Ethyl bromoacetate

FORMULA

- \( \text{BrCH}_2\text{COOC}_2\text{H}_5 \)

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>TDLO subcutaneous - mouse</td>
<td>332 mg/kg</td>
<td>83W neoplastic</td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>167.01</td>
</tr>
<tr>
<td>BOILING POINT</td>
<td>160°C</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>-20°C</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H₂O = 1)</td>
<td>1.51</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Insoluble</td>
</tr>
<tr>
<td>APPEARANCE AND OdOR</td>
<td>Colorless to straw colored liquid</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD₅₀ ORAL</td>
<td></td>
</tr>
<tr>
<td>LD₅₀ PERCUT.</td>
<td></td>
</tr>
<tr>
<td>LC₅₀ SPECIES</td>
<td></td>
</tr>
<tr>
<td>LC₅₀ CONC.</td>
<td></td>
</tr>
<tr>
<td>FLASH POINT</td>
<td>None available</td>
</tr>
<tr>
<td>METHOD USED</td>
<td></td>
</tr>
<tr>
<td>EXTINGUISHING MEDIA</td>
<td>Water, alcohol foam, carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION

Ethyl bromoacetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

neoplastic

PRINCIPAL ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE

skin and eye irritation, pulmonary edema, dermatitis

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid; wash skin and eyes; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

goggles

MECHANICAL (GENERAL)

gloves

SPECIAL

rubber

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

250-0902B
**PRODUCT DESIGNATION**

03-250-2002
Ethyl - A Bromopropionate

---

**MATERIAL SAFETY DATA SHEET**

---

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<tbody>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
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<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl-2 Bromopropionate</td>
<td>CH₃CHBrCOOC₂H₅</td>
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---

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD % WT. OR VOL.</th>
<th>LC₅₀ SPECIES CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APPLIED SPECIES</th>
<th>LC₅₀ ORAL</th>
<th>LC₅₀ PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
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</thead>
<tbody>
<tr>
<td>none available</td>
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**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>MW</th>
<th>181.04</th>
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</thead>
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<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>160-5°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>0°F</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>at 55°C</td>
</tr>
<tr>
<td>Vapour Density (Air = 1)</td>
<td>10</td>
</tr>
<tr>
<td>Evaporation Rate (________ = 1)</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.35</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless Liquid</td>
</tr>
</tbody>
</table>

---

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHOD USED</th>
<th>FLAMMABLE LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UPPPER</td>
</tr>
<tr>
<td></td>
<td>LOWER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th>FLAMMABLE LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER, ALCOHOL FOAM, CARBON DIOXIDE, DRY CHEMICAL</td>
<td></td>
</tr>
</tbody>
</table>

---

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

---

**UCN-11322 (3 10-74)**

---

**250-2002A**
PRODUCT DESIGNATION

Ethyl - A Bromopropionate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

PRINCIPAL ROUTES OF ABSORPTION

inhalation, ingestion

RELEVANT SYMPTOMS OF EXPOSURE

skin and eye irritation, pulmonary edema, dermatitis

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid; wash skin & eyes; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

goggles

MECHANICAL (GENERAL)

gloves

SPECIAL

rubber

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

with proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

250-2002B
PRODUCT DESIGNATION
03-250-2102
Ethyl - B Bromopropionate

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNOMYS

FORMULA

SECTION II HAZARDOUS INGREDIENTS

APPYXIMATE ESTABLISHED
ARTICLE OR MAXIMUM % WT. OR VOL. OSHA STANDARD

LD<sub>50</sub> ORAL

LC<sub>50</sub> PERCU.

SPECIES CONC.

none available

SECTION III PHYSICAL DATA MW - 181.04

BOILING POINT 112°C at 44 mm

VAPOR PRESSURE 0°F. at 73°C mm Hg.

MELTING POINT-

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H<sub>2</sub>O = 1)

EVAPORATION RATE ( = 1)

1.41

SOLUBILITY IN WATER Pts/100 pts H<sub>2</sub>O

VOLATILE % Vol.

% Wt.

APPEARANCE AND ODOR

yellow liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

METHOD USED

EXTINGUISHING MEDIA

water, alcohol foam, carbon dioxide, dry chemical

SPECIAL, FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION

Ethyl - B - Bromopropionate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE IRRITATION

severe

RELEVANT SYMPTOMS OF EXPOSURE

skin & eye irritation, pulmonary edema, dermatitis

EFFECTS OF CHRONIC EXPOSURE

SEVERE SKIN & EYE IRRITATION, PULMONARY EDEMA, DERMATITIS

EMERGENCY AND FIRST AID PROCEDURES.

If swallowed - give emetic, get medical aid; wash skin & eyes; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS

LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE

goggles

MECHANICAL (GENERAL)

gloves

rubber

SPECIAL

HESPIRATOR

with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

250-2102B
### Product Designation

03-250-2702
Ethyl Carbonate

### Section I Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diethyl Carbonate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD_{50}</th>
<th>LC_{50}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td>Subcutaneous - rat</td>
<td>LD_{50} 8200 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Section II Hazardous Ingredients

<table>
<thead>
<tr>
<th>Hazardous Ingredient</th>
<th>Approximate LD_{50} or MAXIMUM % WT. OR VOL.</th>
<th>Established OSHA Standard</th>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD_{50}</th>
<th>LC_{50}</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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### Section III Physical Data

<table>
<thead>
<tr>
<th>Physical Property</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>127°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-43°C</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.98</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid, mild odor</td>
</tr>
</tbody>
</table>

### Section IV Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Hazardous Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>77°F</td>
</tr>
</tbody>
</table>

- Method Used: open cup
- Extinguishing Media: carbon dioxide, dry chemical, water may be ineffective.
- Special Fire Fighting Procedures

**Unusual Fire and Explosion Hazards**

UCN-11322
(3 10-74)
PRODUCT DESIGNATION
Ethyl Carbonate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

MAC 200 PPM

CARCINOGENIC neoplastic

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Gasping, loss of coordination, pulmonary edema, nose & throat irritation.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - give emetic, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Absorb on paper towels, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

goggles

SPECIAL

gloves

OTHER PROTECTIVE EQUIPMENT

RESPIRATOR with proper filter

WORKING CLOTHES

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

250-2702B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER’S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Ethyl Chloroacetate

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>none available</td>
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<td></td>
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SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>Merit</th>
<th>Value</th>
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<tbody>
<tr>
<td>Boiling Point</td>
<td>144°F</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-27°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>1.16</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid, fruity odor</td>
</tr>
</tbody>
</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>179°F</td>
</tr>
<tr>
<td>Flammable (Explosive) Limits</td>
<td></td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Water may be used to blanket fire, alcohol foam, carbon dioxide or dry chemical.</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td></td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td></td>
</tr>
</tbody>
</table>

250-3502A
PRODUCT DESIGNATION
Ethyl chloroacetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC
NO

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION
severe

RELEVANT SYMPTOMS OF EXPOSURE
skin and eye irritation, pulmonary edema.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; wash skin & eyes; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towels, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE

goggles

MECHANICAL (GENERAL)

GLOVES

rubber

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside or detached storage preferred, inside storage in flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

250-3502B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL | APPROXIMATE OR MAXIMUM % WT. OR VOL. | ESTABLISHED OSHA STANDARD | LD₅₀ | LC₅₀
---|---|---|---|---

LCLO - inhalation - mouse 2260 mg/cm
Lowest published lethal dose
intraperitoneal - mouse 15 mg/kg.

SECTION III PHYSICAL DATA

MW = 108.53

BOILING POINT

93°C

MELTING POINT

61°C

SPECIFIC GRAVITY (H₂O = 1)

1.14

SOLUBILITY IN WATER Pts/100 pts H₂O

decomposes

APPEARANCE AND ODOR

colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

61°F

METHOD USED

C.C.

EXTINGUISHING MEDIA

carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Ethyl chlorocarbonate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC
no

PRINCIPAL ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION
severe

RELEVANT SYMPTOMS OF EXPOSURE
eye irritation, irritation of upper respiratory tract, pulmonary edema.

EFFECTS OF CHRONIC EXPOSURE
--

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

WATER REACTIVITY (COMPOSITION PRODUCTS)

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb on paper towels, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE
Goggles
GLOVES
Gloves
RESPIRATOR
Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside or detached storage preferred, inside storage in flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE
DATE

250-3702B
ETHYLENE BROMIDE

SECTION I SOURCES AND NOMENCLATURE

MANUFACTURER'S NAME

EH-92750

EMERGENCY TELEPHONE NO.

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE
OR MAXIMUM
% WT. OR VOL.

LDs0 mg/kg

LC50 ppm

ESTABLISHED
OSHA
STANDARD

LD50 ORAL PERCUT.

SPECIES CONC.

140 Rat 689

LD50 oral - human 50 mg/kg

LD50 oral - woman 90 mg/kg

Note: Lowest published toxic dose, oral human - 4500 mg/kg.

SECTION III PHYSICAL DATA

MW-187.88

BOILING POINT

131.4°C 269.5°F

VAPOR PRESSURE

17.4 mm at 30°C

millimeters Hg.

MELTING POINT

9.3°C 48.7°F

VAPOR DENSITY (Air = 1)

6.48

SPECIFIC GRAVITY (H2O = 1)

2.17 at 25°C

EVAPORATION RATE (Air = 1)

SPECIFIC GRAVITY

0.43 g

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Heavy colorless liquid with sweet odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLAMMABLE (EXPLOSIVE) LIMITS

FLAMMABLE

UPPER

LOWER

EXTINGUISHING MEDIA

Alcohol foam, dry chemical or CO2

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A
PRODUCT DESIGNATION
Ethylene Bromide

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
TLV 20 ppm, 145 mg/C.M.

CARCINOGENIC Yes

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion & skin

SKIN AND EYE IRITATION Very irritating

RELEVANT SYMPTOMS OF EXPOSURE
Inhalation - pulmonary edema; irritation of eyes and blistering and burning of skin; central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE
Liver & kidney damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - remove from exposure, rest, keep warm; if swallowed - wash mouth, give emetic, get medical aid; wash from eyes and skin.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS
Dangerous - when heated to decomposition, it emits highly toxic fumes of bromides.

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb spills on paper towels, evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
Get advice from Industrial Hygiene Department

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE Goggles or Safety Glasses

MECHANICAL (GENERAL)
Get advice from Industrial Hygiene Department

GLOVES Neoprene Gloves

SPECIAL
Get advice from Industrial Hygiene Department

RESPIRATOR w/organic filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Protect containers against physical damage.

OTHER PRECAUTIONS

SIGNATURE DATF

250-6202B
PRODUCT DESIGNATION
03-250-6402
Ethylene Bromohydrin

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
2 Bromoethanol

SECTION II HAZARDOUS INGREDIENTS

Basic Material

<table>
<thead>
<tr>
<th>APPROXIMATE OR MAXIMUM</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50</th>
<th>LC50</th>
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<tbody>
<tr>
<td>%WT. OR VOL.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lowest published lethal</td>
<td>intraperitoneal - mouse</td>
<td>90 mg/kg</td>
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SECTION III PHYSICAL DATA

MW - 124.98

<table>
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<th>PROPERTY</th>
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<tbody>
<tr>
<td>Boiling Point</td>
<td>149-150°C (Dec)</td>
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<tr>
<td>Melting Point</td>
<td></td>
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<tr>
<td>Specific Gravity</td>
<td>1.79</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>soluble</td>
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<tr>
<td>Appearance and Odor</td>
<td>colorless liquid</td>
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</table>

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flammable Limits

<table>
<thead>
<tr>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
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</thead>
<tbody>
<tr>
<td>Upper</td>
</tr>
<tr>
<td>Lower</td>
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</table>

Extinguishing Media
alcohol foam, carbon dioxide, dry chemical

Special Fire Fighting Procedures
Wear protective clothing and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Ethylene bromohydrin

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE Eye and mucous membrane irritation, nausea, headache, vomiting, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

GOGGLES

MECHANICAL (GENERAL) GLOVES

rubber

SPECIAL RESPIRATOR

with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

250-6402B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

1 Bromo 2 chloroethane

FORMULA

\( \text{BrC}_2\text{H}_2\text{Cl} \)

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD_{50} mg/kg</th>
<th>LC_{50}</th>
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</thead>
<tbody>
<tr>
<td>Oral - human</td>
<td>LDLO 50 mg/kg</td>
<td></td>
<td>64</td>
<td>rat</td>
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SECTION III PHYSICAL DATA

MW = 143.4

<table>
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<th>PROPERTY</th>
<th>VALUE</th>
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<tbody>
<tr>
<td>Boiling Point</td>
<td>106°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-18°C</td>
</tr>
<tr>
<td>Specific Gravity ( \text{H}_2\text{O} = 1 )</td>
<td>1.72</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>100 pts H(_2)O</td>
</tr>
</tbody>
</table>

| APPEARANCE AND ODOR | colorless, volatile liquid, sweet chloroform-like odor. |

SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>not flammable</td>
</tr>
</tbody>
</table>

METHOD USED

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Ethylene chlorobromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE IRRITATION
severe

RELEVANT SYMPTOMS OF EXPOSURE
Pneumonia, skin & eye irritation, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS
LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE goggles

MECHANICAL (GENERAL)

GLOVES rubber

SPECIAL

RESPIRATOR with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

250-6702B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 OR LC50

ORAL PERCU.IN. SPECIES CONC.

LD50 oral - human 50 mg/kg

LC50 - oral - human 300 ppm/2 hr.

LC50 oral - human 5000 mg/kg

SECTION III PHYSICAL DATA

MW = 80.52

BOILING POINT 129°C

VAPOR PRESSURE at 30.3°C mm Hg

10

MELTING POINT -69°C

VAPOR DENSITY (Air = 1)

2.78

SPECIFIC GRAVITY (H₂O = 1)

1.21

EVAPORATION RATE ( = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE % Vol.

% Wt.

APPEARANCE AND ODOR

colorless liquid, faint ethereal odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 140°F

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER 15.9 LOWER 4.9

METHOD USED O.C.

EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES wear protective clothing & self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS When heated to decomposition it emits toxic fumes (Phosgene)
PRODUCT DESIGNATION
Ethylene Chlorohydrin

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 1 PPM, 3 mg/C.M. (ceiling value)

CARCINOGENIC no

SKIN AND EYE
IRRITATION Severe

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Eye and nasal irritation, nausea, vomiting, giddiness, dizziness, uncoordination, visual disturbances, coma.

EFFECTS OF CHRONIC EXPOSURE
Nausea, vomiting, abdominal pain.

EMERGENCY AND FIRST AID PROCEDURES
Wash eyes & skin; if swallowed - give emetic, get medical aid; inhalation - rest, give oxygen as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

EYE goggles

SPECIAL

rubber (neoprene)

RESPIRATOR with proper filter

OTHER PROTECTIVE EQUIPMENT

Plastic coveralls

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside or detached storage preferred, inside in flammable liquids cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

250-6902B
**SECTION I SOURCE AND NOMENCLATURE**

**MANUFACTURER'S NAME**

**ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)**

**TRADE NAME AND SYNONYMS**

**CHEMICAL NAME AND SYNONYMS**

Ethylene Glycol Diacetate

**FORMULA**

(CH₂OOCCH₃)₂

**SECTION II HAZARDOUS INGREDIENTS**

**BASIC MATERIAL**

**APPROXIMATE OR MAXIMUM % WT. OR VOL.**

**ESTABLISHED OSHA STANDARD**

**LD₅₀ mg/kg.**

**LC₅₀**

**ORAL**

**PERCUT.**

**SPECIES**

**CONC.**

Oral - human LD₅₀ 500 mg/kg.

4940 quinea pig

6850 rat

8480 rabbit

**SECTION III PHYSICAL DATA**

**MW - 146.14**

**BOILING POINT**

191°C 0°F.

**VAPOR PRESSURE**

at 38°C mm Hg.

1

**MELTING POINT**

-31°C 0°F.

**VAPOR DENSITY (Air = 1)**

5.04

**SPECIFIC GRAVITY (H₂O = 1)**

1.13

**EVAPORATION RATE ( ) = 1)**

**SOLUBILITY IN WATER**

Pts/100 pts H₂O

**VOLATILE**

% Vol.

% Wt.

**APPEARANCE AND ODOR**

colorless liquid

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

**FLASH POINT**

205°F

**METHOD USED**

O.C.

**FLAMMABLE (EXPLOSIVE) LIMITS**

**UPPER**

**LOWER**

**EXTINGUISHING MEDIA**

water, alcohol foam, carbon dioxide, dry chemical

**SPECIAL FIRE FIGHTING PROCEDURES**

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

may react with oxidizing materials.
PRODUCT DESIGNATION
Ethylene Diacetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion (mainly)

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Coldness, spastic contraction of muscles, loss of reflexes, coma, death; pulmonary edema, eye irritation.

EFFECTS OF CHRONIC EXPOSURE
Kidney damage, rapid weight loss, weakened reflexes.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; wash from eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)
GLOVES

SPECIAL
RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

250-7202B
PRODUCT DESIGNATION
03-250-7402
Ethylene Diamine

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME
EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS
1,2 Ethanedi amine

CHEMICAL NAME AND SYNONYMS
Diamineethane

FORMULA
H₂N(CH₂)₂NH₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD
LD₅₀ mg/kg
LC₅₀ PPM

ORAL PERCUT. SPECIES CONC.

1160 rat 4000
730 mouse
470 rabbit
guinea pig

SECTION III PHYSICAL DATA

MW - 60.10

BOILING POINT
117°C
110°F

VAPOR PRESSURE
at 20°C
11 mm Hg.

MELTING POINT
9°C
9°F

VAPOR DENSITY (Air = 1)
2.07

SPECIFIC GRAVITY (H₂O = 1)
0.899

EVAPORATION RATE (1) = 1

SPECIFIC GRAVITY IN WATER
28/100 pts H₂O

VOLATILE
% Vol.

SOLUBILITY IN WATER
soluble
% Wt.

APPEARANCE AND ODOR
colorless, hygroscopic liquid, ammonia-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
110°F

METHOD USED
O.C.

EXTINGUISHING MEDIA
Carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
Can react with oxidizing materials.
PRODUCT DESIGNATION
Ethylene Diamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 10 PPM, 25 mg/C.M.

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation (mainly) ingestion
SKIN AND EYE
IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritation respiratory system, allergic effects, eye irritation with tearing, corneal edema, headache, nausea.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, lung, kidney and liver damage.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Put sodium bisulfite powder on spill; add water.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber (butyl)

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT
Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside or detached storage preferred; inside storage in flammable liquids cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

250-7402B
**PRODUCT DESIGNATION**

Ethylene Chloride (Ethylene dichloride)
03-250-7702
03-250-7732

**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<table>
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<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
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<tbody>
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<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CH₂ClCH₂Cl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2-Dichloroethane</td>
<td>CH₂ClCH₂Cl</td>
</tr>
</tbody>
</table>

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀ mg/kg</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ORAL</td>
<td>PERCUT.</td>
</tr>
<tr>
<td>Oral - human</td>
<td>LD₅₀ 500 mg/kg</td>
<td></td>
<td>680</td>
<td></td>
</tr>
<tr>
<td>Oral - man</td>
<td>LD₅₀ 810 mg/kg</td>
<td></td>
<td>860</td>
<td>3890</td>
</tr>
</tbody>
</table>

Notes: Lowest published toxic concentration in air: inhalation - human 4000 ppm.
Lowest published toxic dose; oral - human 845 mg/kg.

**SECTION III  PHYSICAL DATA**

<table>
<thead>
<tr>
<th>Boiling Point</th>
<th>°F.</th>
<th>Vapor Pressure at 29.4°C</th>
<th>100 mm Hg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>83.5°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Melting Point</th>
<th>°F.</th>
<th>Vapor Density (Air = 1)</th>
<th>3.35</th>
</tr>
</thead>
<tbody>
<tr>
<td>-35.4°C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Specific Gravity (H₂O = 1)</th>
<th>1.257 at 20°/4°C</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Solubility in Water (Pts/100 Pt's H₂O)</th>
<th>0.81 g at 20°C</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Appearance and Odor</th>
<th>Colorless liquid with chloroform-like odor.</th>
</tr>
</thead>
</table>

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>Flash Point</th>
<th>°F</th>
<th>Flash Explosive (Explosive) Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>55.4°F</td>
<td>65°F</td>
<td>Upper 15.9 % lower 6.2 %</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method Used</th>
<th>Closed Cup</th>
<th>Open Cup</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Extinguishing Media</th>
<th>Dry chemical, foam, or carbon dioxide - water may be ineffective.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Special Fire Fighting Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear self-contained breathing apparatus in pressure demand mode.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unusual Fire and Explosion Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapor forms explosive mixtures in air. May flash back.</td>
</tr>
</tbody>
</table>

**ICN-11322**
(3 10-74)
**PRODUCT DESIGNATION**: Ethylene Chloride

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**

TLV 50 ppm, 200 mg/C.M.

**CARCINOGENIC** Yes

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

Aluminum, N2O4, ammonia, dimethyl amine, propyl amine.

**HAZARDOUS DECOMPOSITION PRODUCTS**

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

Absorb with paper towels, evaporate in hood.

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

Exhaust ventilation needed.

**MECHANICAL (GENERAL)**

Goggles

**SPECIAL**

Gloves

Rubber

Respirator w/appropriate filter

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

Standard flammable liquids storage room or cabinet.

**OTHER PRECAUTIONS**

Protect against physical damage.

**SIGNATURE**

**DATE**

250-7702B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

1,2 Ethanediol

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50 mg/kg

LC50 %

ORAL PERCUT. SPECIES CONC.

LD50 Oral - human - 1500 mg/kg.

LC50 Oral - human - 1500 mg/kg.

TCLO inhalation - human 1000 mg/cm2 irritant

SECTION III PHYSICAL DATA

MW - 62.1

BOILING POINT 198°C

MELTING POINT -13°C

SPECIFIC GRAVITY (H2O = 1) 1.11

SOLUBILITY IN WATER very soluble

APPEARANCE AND ODOR colorless, sweet tasting liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 232°F

METHOD USED CC

EXTINGUISHING MEDIA alcohol foam, water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Ethylene Glycol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 100 PPM, 260 mg/C.M. (vapor)

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion (mainly)

RELEVANT SYMPTOMS OF EXPOSURE Coldness, spastic contraction of muscles, loss of reflexes, coma, death; pulmonary edema, eye irritation.

EFFECTS OF CHRONIC EXPOSURE
Kidney damage, rapid weight loss, weakened reflexes.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic; get medical aid; wash from eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)

SPECIAL

OTHER PROTECTIVE EQUIPMENT

Protective clothing

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

GLOVES
Rubber gloves

RESPIRATOR
With chemical filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

250-8202B
GAS-00011597

PRODUCT DESIGNATION
03-250-8402
Ethylene Glycol Diacetate

KW40250

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
Ethylene Diacetate

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
BASIC MATERIAL OR MAXIMUM OSHA STANDARDS
% WT. OR VOL.

LD50 - oral - human 500 mg/kg

4940 guinea pig

6850 rat

8480 rabbit

SECTION III PHYSICAL DATA

MW - 146.14

BOILING POINT 191°C 6°F.

MELTING POINT -31°C 6°F.

SPECIFIC GRAVITY (H2O = 1) 1.13

SPECIES SPECIES SPECIES SPECIES

CONC.

VAPOR DENSITY (Air = 1) 5.04

EVAPORATION RATE (%) 1

VOLATILE % VOL.

% WT.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 205°F

METHOD USED O.C.

EXTINGUISHING MEDIA Water, alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

May react with oxidizing materials.
PRODUCT DESIGNATION
Ethylene Glycol Diacetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion (mainly)

SKIN AND EYE
IRRITATION
moderate

RELEVANT SYMPTOMS OF EXPOSURE
Coldness, spastic contraction of muscles, loss of reflexes, coma, death; pulmonary edema, eye irritation.

EFFECTS OF CHRONIC EXPOSURE
Kidney damage, rapid weight loss, weakened reflexes.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; wash from eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

250-8402B
PRODUCT DESIGNATION
03-251 3303
Ethylidene Bromide

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER’S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS
1,1 dibromoethane

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL APPROXIMATE OR MAXIMUM ESTABLISHED OSHA STANDARD LD50 LC50
% WT. OR VOL.

LDLo rectal - rabbit 1250 mg/kg none available

SECTION III PHYSICAL DATA MW = 187.8°

BOILING POINT 109°C 0°F. VAPOR PRESSURE mm Hg.

MELTING POINT °F.

SPECIFIC GRAVITY (H2O = 1) 2.06

SOLUBILITY IN WATER Pts/100 pts H2O insoluble

APPEARANCE AND ODOR liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT not available

METHOD USED

EXTINGUISHING MEDIA not available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
PRODUCT DESIGNATION
Ethylidine Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

Carcinogenic

PRINCIPAL ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Central nervous system depression, eye irritation, dermatitis

EFFECTS OF CHRONIC EXPOSURE
Liver damage, dermatitis

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid;
inhalation - rest; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE

MECHANICAL (GENERAL)

Goggles

SPECIAL

GLOVES rubber

OTHER PROTECTIVE EQUIPMENT

RESPIRATOR with proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

251-3303B
PRODUCT DESIGNATION
03-251-3503
Ethylidene Chloride

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50

LC50

ORAL PERCUT. SPECIES CONC.

SECTION III PHYSICAL DATA

MW = 98.97

BOILING POINT 58°C

VAPOR PRESSURE at 25°C mm Hg

230

MELTING POINT -97°C

VAPOR DENSITY (Air = 1) 3.44

SPECIFIC GRAVITY (H2O = 1) EVAPORATION RATE (~ = 1)

1.17 1.17

SOLUBILITY IN WATER Pts/100 pts H2O VOLATILE % Vol. % Wt.

0.5

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 22°F

FLAMMABLE (EXPLOSIVE) LIMITS

UPPER LOWER

11.4% 5.6%

METHOD USED

C.C.

EXTINGUISHING MEDIA

Alcohol foam, water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

Wear full protective clothing
PRODUCT DESIGNATION
Ethylidene Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 200 PPM, 320 mg/C.M.

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Central nervous system depression, eye irritation, dermatitis.

EFFECTS OF CHRONIC EXPOSURE
Liver damage, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - get medical aid; inhalation - rest; wash eyes & skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Absorb spill with paper towels, place in hood for evaporation.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

GOGGLES

SPECIAL

GLOVES

OTHER PROTECTIVE EQUIPMENT

RUBBER

WORKING CLOTHING

RESPIRATOR WITH PROPER FILTER

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

251-3503B
SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

CHEMICAL FAMILY

FORMULA

C₂H₇I

SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD LD₅₀</th>
<th>LC₅₀</th>
<th>ORAL</th>
<th>PERCUT.</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III PHYSICAL DATA

MW - 155.98

BOILING POINT

72.2°C

0°F.

VAPOR PRESSURE

at 25°C 137 mm Hg.

MELTING POINT

-108.5°C

0°F.

VAPOR DENSITY (Air = 1) 5.4

SPECIFIC GRAVITY (H₂O = 1) 1.92

EVAPORATION RATE (1 in = 1)

SPECIES

UPPER CONC.

mm Hg.

137

% Vol.

% Wt.

0.4

APPEARANCE AND ODOR

Colorless liquid, ethereal odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

METHOD USED

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

When heated to decomposition points, emits toxic fumes of iodates.

When heated to decomposition points, emits toxic fumes of iodates.
**PRODUCT DESIGNATION**
Ethyl iodide

**SECTION V HEALTH HAZARD DATA**

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>CARCINOGENIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not available</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRINCIPLE ROUTES OF ABSORPTION</th>
<th>SKIN AND EYE IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation, ingestion, skin</td>
<td>slight</td>
</tr>
</tbody>
</table>

**RELEVANT SYMPTOMS OF EXPOSURE**
Nausea, vomiting, diarrhea, dizziness, visual disturbances, irritability, drowsiness, central nervous system depressant.

**EFFECTS OF CHRONIC EXPOSURE**
Dermatitis

**EMERGENCY AND FIRST AID PROCEDURES**
Inhalation - rest; if swallowed - wash mouth, give emetic, get medical aid; wash from skin & eyes.

**SECTION VI REACTIVITY DATA**

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO INSTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INCOMPATABILITY (MATERIALS TO AVOID)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HAZARDOUS DECOMPOSITION PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SECTION VII SPILL OR LEAK PROCEDURES**

<table>
<thead>
<tr>
<th>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SECTION VIII SPECIAL PROTECTION INFORMATION**

<table>
<thead>
<tr>
<th>VENTILATION REQUIREMENTS LOCAL EXHAUST</th>
<th>PROTECTIVE EQUIPMENT (SPECIFY TYPES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eye safety goggles</td>
</tr>
<tr>
<td></td>
<td>Gloves</td>
</tr>
<tr>
<td></td>
<td>Resin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MECHANICAL (GENERAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER PROTECTIVE EQUIPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**SECTION IX SPECIAL PRECAUTIONS**

<table>
<thead>
<tr>
<th>PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**OTHER PRECAUTIONS**

<table>
<thead>
<tr>
<th>SIGNATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**DATE**

251-4303B
## Material Safety Data Sheet

**Product Designation:**
03-251-6903  
Ethyl Orthosilicate

### SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethyl-0-silicate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Family</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>((C_2H_5)_{3}SiO)</td>
</tr>
</tbody>
</table>

### SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Materials</th>
<th>Approximate LD_50</th>
<th>Estimated LC_50</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oral</td>
<td>Percut.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- LC_50 inhalation - rat 1000 PPM/4 hrs.
- LD_50 oral - rat - 1000 mg/kg

### SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>166°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-83°C</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.93</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>100%</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid, faint odor</td>
</tr>
</tbody>
</table>

### SECTION IV  FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>125°F</td>
</tr>
<tr>
<td>Method Used</td>
<td>O.C.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extinguishing Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unusual Fire and Explosion Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
### PRODUCT DESIGNATION
Ethyl Orthosilicate

### SECTION V HEALTH HAZARD DATA

<table>
<thead>
<tr>
<th>TOXIC LEVEL</th>
<th>TLV 10 PPM, 85 mg/C.M.</th>
</tr>
</thead>
</table>

**Carcinogenic**: no

**Principle Routes of Absorption**: Inhalation, ingestion

**Skin and Eye Irritation**: Severe

**Relevant Symptoms of Exposure**: Irritation of eyes and upper respiratory tract, tremors, weakness, narcosis and death.

**Effects of Chronic Exposure**: Liver, kidney and lung damage

**Emergency and First Aid Procedures**:

- If swallowed - give emetic, get medical aid; wash from skin & eyes; inhalation - rest.

### SECTION VI REACTIVITY DATA

**Conditions Contributing to Instability**

**Conditions Contributing to Hazardous Polymerization**

**Incompatibility (Materials to Avoid)**

**Hazardous Decomposition Products**

### SECTION VII SPILL OR LEAK PROCEDURES

**Steps to be Taken in Case Material is Released or Spilled**

Absorb on paper towels, evaporate in hood.

**Waste Disposal Method**

### SECTION VIII SPECIAL PROTECTION INFORMATION

<table>
<thead>
<tr>
<th>Ventilation Requirements</th>
<th>Local Exhaust</th>
</tr>
</thead>
</table>

**Protective Equipment (Specify Types)**

- Eye goggles
- Gloves
- Respirator with proper filter

**Protective Clothing**

### SECTION IX SPECIAL PRECAUTIONS

**Precautions to be Taken in Handling and Storage**

Protect container against physical damage - outside or detached storage is preferred.

**Other Precautions**

**Signature**

**Date**

251-6903B
### SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl Thiocarbimide</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl ISOthiocyanate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOURCE AND NOMENCLATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT DESIGNATION</td>
</tr>
<tr>
<td>03-251-9303</td>
</tr>
<tr>
<td>Ethyl ISOthiocyanate</td>
</tr>
</tbody>
</table>

### SECTION II HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD$_{50}$</th>
<th>LC$_{50}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SECTION III PHYSICAL DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>87.2</td>
</tr>
<tr>
<td>BOILING POINT</td>
<td>131°C</td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>-6°C</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H$_2$O = 1)</td>
<td>1.00</td>
</tr>
<tr>
<td>SOLUBILITY IN WATER</td>
<td>Pts/100 Pts H$_2$O</td>
</tr>
<tr>
<td>APPEARANCE AND ODOR</td>
<td>colorless liquid, pungent odor</td>
</tr>
</tbody>
</table>

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLASH POINT</td>
<td>none available</td>
</tr>
<tr>
<td>METHOD USED</td>
<td>carbon dioxide, dry chemical</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPPER</td>
</tr>
<tr>
<td>LOWER</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>wear full protective clothing, self-contained breathing apparatus.</td>
</tr>
</tbody>
</table>
**PRODUCT DESIGNATION**

Ethyl Iso-Thiocyanate

**SECTION V HEALTH HAZARD DATA**

**TOXIC LEVEL**

none available

**CARCINOGENIC**

no

**PRINCIPLE ROUTES OF ABSORPTION**

ingestion, inhalation

**SKIN AND EYE**

IRRITATION

severe

**RELEVANT SYMPTOMS OF EXPOSURE**

Irritation of eyes, respiratory system, irritation of digestive tract.

**EFFECTS OF CHRONIC EXPOSURE**

---

**EMERGENCY AND FIRST AID PROCEDURES**

If swallowed - induce vomiting, get medical aid; wash skin & eyes; inhalation - rest.

**SECTION VI REACTIVITY DATA**

**CONDITIONS CONTRIBUTING TO INSTABILITY**

---

**CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION**

---

**INCOMPATABILITY (MATERIALS TO AVOID)**

May react with oxidizing materials and acids.

**HAZARDOUS DECOMPOSITION PRODUCTS**

---

**SECTION VII SPILL OR LEAK PROCEDURES**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**

---

**WASTE DISPOSAL METHOD**

---

**SECTION VIII SPECIAL PROTECTION INFORMATION**

**VENTILATION REQUIREMENTS LOCAL EXHAUST**

---

**LOCAL EXHAUST**

---

**PROTECTIVE EQUIPMENT (SPECIFY TYPES)**

**EYE**

goggles

**GLOVES**

rubber

**RESPIRATOR**

self-contained

**SPECIAL RESPIRATOR**

---

**OTHER PROTECTIVE EQUIPMENT**

---

**SECTION IX SPECIAL PRECAUTIONS**

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

---

**OTHER PRECAUTIONS**

---

**SIGNATURE**

---

**DATE**

---

251-9303B
## Material Safety Data Sheet

### Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (number, street, city, state, zip code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl-M-Toluidine</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Family</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( \text{CH}_2\text{C}_6\text{H}_4\text{NH}_2\text{H} )</td>
</tr>
</tbody>
</table>

### Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>none available</td>
</tr>
</tbody>
</table>

### Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point (°C)</td>
<td>221</td>
</tr>
<tr>
<td>Melting Point (°F)</td>
<td></td>
</tr>
<tr>
<td>Vapor Pressure (mm Hg.) at 102°C</td>
<td>10</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate (1)</td>
<td></td>
</tr>
<tr>
<td>Solubility in Water (pts/100 pts H₂O)</td>
<td>insoluble</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td></td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>liquid</td>
</tr>
</tbody>
</table>

### Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>none available</td>
</tr>
<tr>
<td>Method Used</td>
<td></td>
</tr>
</tbody>
</table>

| Extinguishing Media               |       |
| Alcohol foam, carbon dioxide, dry chemical |

| Special Fire Fighting Procedures  |       |
| wear full protective clothing.    |       |

| Unusual Fire and Explosion Hazards |       |
|                                   |       |
PRODUCT DESIGNATION
Ethyl-M-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC NO

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, weakness

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic; get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

EQUIPMENT AND SPECIAL

PROTECTIVE EQUIPMENT

Goggles

rubber

HEALTH PROTECTIVE EQUIPMENT

with proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside storage preferred. Inside storage in a standard flammable liquid storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

251-9523B
SECTION I  SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Ethyl-O-Toluidine

SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LD₅₀: ORAL PERCUT. SPECIES CONC.

none available

SECTION III  PHYSICAL DATA

MW = 135.20

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>216°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>&lt; -15°C</td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td>0.95</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>insoluble</td>
</tr>
</tbody>
</table>

APPEARANCE AND ODOR

liquid

SECTION IV  FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

METHOD USED

EXTINGUISHING MEDIA

alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

wear full protective clothing

UNUSUAL FIRE AND EXPLOSION HAZARDS

251-9553A
### Product Designation
Ethyl-O-Toluidine

### Section V: Health Hazard Data

**Toxic Level**
none available

**Principle Routes of Absorption**
Inhalation, ingestion, skin

**Skin and Eye Irritation**
moderate

**Relevant Symptoms of Exposure**
cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions.

**Effects of Chronic Exposure**
Weight loss, anemia, weakness.

**Emergency and First Aid Procedures**
If swallowed - give emetic, get medical aid;
inhalation - rest; wash from skin & eyes.

### Section VI: Reactivity Data

**Conditions Contributing to Instability**

**Conditions Contributing to Hazardous Polymerization**

**Incompatibility (Materials to Avoid)**

**Hazardous Decomposition Products**

### Section VII: Spill or Leak Procedures

**Steps to be Taken in Case Material is Released or Spilled**

### Section VIII: Special Protection Information

**Ventilation Requirements Local Exhaust**

**Protective Equipment (Specify Types)**
- Eye goggles
- Rubber gloves
- Respirator with proper filter

**Mechanical (General)**

**Special**

**Other Protective Equipment**

### Section IX: Special Precautions

**Precautions to be Taken in Handling and Storage**
Outside storage preferred. Inside storage in a standard flammable liquid storage cabinet.

**Other Precautions**

**Signature**

**Date**

251-9553B
## SECTION I  SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
</tr>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl-P-Toluidine</td>
<td>CH₃C₆H₄NHC₅H₂</td>
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</table>

## SECTION II  HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

### APPROXIMATE OR MAXIMUM % WT. OR VOL.

<table>
<thead>
<tr>
<th>BASE</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ESTABLISHED OSHA STANDARD

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LD₅₀ AND LC₅₀

<table>
<thead>
<tr>
<th>ORAL</th>
<th>PERCUT.</th>
</tr>
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<tbody>
<tr>
<td></td>
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</table>

### none available

## SECTION III  PHYSICAL DATA

<table>
<thead>
<tr>
<th>MW</th>
<th>135.20</th>
</tr>
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</table>

### BOILING POINT

<table>
<thead>
<tr>
<th>°C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>217</td>
<td>422</td>
</tr>
</tbody>
</table>

### MELTING POINT

<table>
<thead>
<tr>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

### SPECIFIC GRAVITY (H₂O = 1)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.94</td>
<td></td>
</tr>
</tbody>
</table>

### VAPOR PRESSURE

<table>
<thead>
<tr>
<th>at 101°C</th>
<th>mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

### VAPOR DENSITY (Air = 1)

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

### EVAPORATION RATE (____ = 1)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SOLUBILITY IN WATER

<table>
<thead>
<tr>
<th>Pts/100 pts H₂O</th>
</tr>
</thead>
<tbody>
<tr>
<td>insoluble</td>
</tr>
</tbody>
</table>

### VOLATILE

<table>
<thead>
<tr>
<th>% Vol.</th>
<th>% Wi.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### APPEARANCE AND ODOR

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>liquid</td>
</tr>
</tbody>
</table>

## SECTION IV  FIRE AND EXPLOSION HAZARD DATA

### FLASH POINT

| none available |
|                |

### METHOD USED

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

### EXTINGUISHING MEDIA

<table>
<thead>
<tr>
<th>alcohol foam, carbon dioxide, dry chemical</th>
</tr>
</thead>
</table>

### SPECIAL FIRE FIGHTING PROCEDURES

<table>
<thead>
<tr>
<th>wear full protective clothing.</th>
</tr>
</thead>
</table>

### UNUSUAL FIRE AND EXPLOSION HAZARDS

<table>
<thead>
<tr>
<th>UCN-11322 (3 10-74)</th>
</tr>
</thead>
<tbody>
<tr>
<td>251-9573A</td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
Ethyl-P-Toluidine

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
cyanosis, air hunger, nausea, vomiting, low blood pressure, convulsions.

EFFECTS OF CHRONIC EXPOSURE
weight loss, anemia, weakness

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid;
inhalation - rest; wash from skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE goggles

MECHANICAL (GENERAL)
Gloves
rubber

SPECIAL RESPIRATOR
with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside storage preferred. Inside storage in a standard flammable liquid storage cabinet.

OTHER PRECAUTIONS

SIGNATURE
DATE

251-9573B
PRODUCT DESIGNATION
03-257-2405
P-Fluorobromobenzene

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

CHEMICAL FAMILY

TRADE NAME AND SYNONYMS

FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD50

LC50

ORAL PERCUT. SPECIES CONC.

none available

SECTION III PHYSICAL DATA

MW - 175.01

BOILING POINT 155°C

°F. VAPOR PRESSURE mm Hg.

MELTING POINT -8°C

°F. VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H2O = 1)

1.60 EVAPORATION RATE (________ = 1)

SOLUBILITY IN WATER %/100 pts H2O

insoluble

VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available

METHOD USED

EXISTING MEDIA use water spray, foam, carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
### PRODUCT DESIGNATION
P-Fluorobromobenzene

## SECTION V HEALTH HAZARD DATA

### TOXIC LEVEL
none available

<table>
<thead>
<tr>
<th>PRINCIPLE ROUTES OF ABSORPTION</th>
<th>SKIN AND EYE</th>
</tr>
</thead>
<tbody>
<tr>
<td>inhalation, ingestion, skin</td>
<td>IRRITATION</td>
</tr>
<tr>
<td></td>
<td>severe</td>
</tr>
</tbody>
</table>

### RELEVANT SYMPTOMS OF EXPOSURE
cyanosis, deep and rapid respiration, irregular pulse, drowsiness, unconsciousness.

### EFFECTS OF CHRONIC EXPOSURE
Lung, liver and kidney damage

### EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

## SECTION VI REACTIVITY DATA

### CONDITIONS CONTRIBUTING TO INSTABILITY

### CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

### INCOMPATABILITY (MATERIALS TO AVOID)

### HAZARDOUS DECOMPOSITION PRODUCTS

## SECTION VII SPILL OR LEAK PROCEDURES

### STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

## SECTION VIII SPECIAL PROTECTION INFORMATION

### VENTILATION REQUIREMENTS LOCAL EXHAUST

### PROTECTIVE EQUIPMENT (SPECIFY TYPES)

<table>
<thead>
<tr>
<th>EYE</th>
<th>GLOVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>goggles</td>
<td>polyvinyl alcohol gloves</td>
</tr>
</tbody>
</table>

### MECHANICAL (GENERAL)

### SPECIAL

### OTHER PROTECTIVE EQUIPMENT

### RESPIRATOR

### self-contained

## SECTION IX SPECIAL PRECAUTIONS

### PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

### OTHER PRECAUTIONS

### SIGNATURE

### DATE

257-2405B
# Material Safety Data Sheet

## Product Designation

**03-257-2505**  
M-Fluorochlorobenzene

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-Fluorochlorobenzene</td>
<td>PC₆H₄Cl</td>
</tr>
</tbody>
</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or VOL.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Approximate LD₅₀

<table>
<thead>
<tr>
<th>Method Used</th>
<th>Flask Point</th>
<th>Extinguishing Media</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>not available</td>
<td>use water spray, foam, carbon dioxide or dry chemical</td>
</tr>
</tbody>
</table>

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point °F</td>
<td>125°C</td>
</tr>
<tr>
<td>Melting Point °F</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity (H₂O = 1)</td>
<td></td>
</tr>
<tr>
<td>Solubility in Water</td>
<td></td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>colorless liquid</td>
</tr>
</tbody>
</table>

## Section IV: Fire and Explosion Hazard Data

- **Upper Flammable Limits**: Flammable (Explosive) Limits
- **Lower Flammable Limits**: Flammable (Explosive) Limits
- **Upper Flammable Limits**: Flammable (Explosive) Limits
- **Lower Flammable Limits**: Flammable (Explosive) Limits
- **Upper Flammable Limits**: Flammable (Explosive) Limits
- **Lower Flammable Limits**: Flammable (Explosive) Limits

- **Unusual Fire and Explosion Hazards**
  - wear self-contained breathing apparatus.
PRODUCT DESIGNATION

M-Fluorochlorobenzene

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, deep and rapid respiration, irregular pulse, drowsiness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Lung, liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
PROTECTIVE EQUIPMENT (SPECIFY TYPES): EYE
MECHANICAL (GENERAL)
goggles

SPECIAL.
gloves

OTHER PROTECTIVE EQUIPMENT
polyvinyl alcohol gloves

RESPIRATOR
self-contained

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE  DATE

257-2505B
### SECTION I SOURCE AND NOMENCLATURE

<table>
<thead>
<tr>
<th>MANUFACTURER’S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)</th>
<th>CHEMICAL FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-Fluorochlorobenzene</td>
<td>FC₆H₄Cl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>SECTION II HAZARDOUS INGREDIENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-Fluorochlorobenzene</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
<th>SPECIES</th>
<th>CONC.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SECTION III PHYSICAL DATA</th>
<th>MW: 130.55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling point</td>
<td>136°C</td>
</tr>
<tr>
<td>Melting point</td>
<td>-43°C</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>(H₂O = 1)</td>
</tr>
<tr>
<td>Solubility in water</td>
<td>50/100 pts H₂O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Appearance and Odor</th>
<th>liquid</th>
</tr>
</thead>
</table>

### SECTION IV FIRE AND EXPLOSION HAZARD DATA

<table>
<thead>
<tr>
<th>Flash point</th>
<th>not available</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Extinguishing Media</th>
<th>Use water spray, foam, carbon dioxide or dry chemical</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Special Fire Fighting Procedures</th>
<th>Wear self-contained breathing apparatus.</th>
</tr>
</thead>
</table>

| Unusual Fire and Explosion Hazards | |
|------------------------------------| |
PRODUCT DESIGNATION

0-Fluorochlorobenzene

SECTION V  HEALTH HAZARD DATA

TOXIC LEVEL
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, deep and rapid respiration, irregular pulse, drowsiness, unconsciousness.

EFFECTS OF CHRONIC EXPOSURE
Lung, liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI  REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII  SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII  SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST -
MECHANICAL (GENERAL)
SPECIAL

OTHER PROTECTIVE EQUIPMENT

SECTION IX  SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

257-2545B
PRODUCT DESIGNATION
03-257-3425
M-Fluorotoluene

MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE
MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

CHEMICAL NAME AND SYNONYMS
M-Fluorotoluene

SECTION II HAZARDOUS INGREDIENTS

APPROXIMATE ESTABLISHED
BASIC MATERIAL OR MAXIMUM OSHA STANDARD LD50 LC50
% WT. OR VOL. ORAL PERCUT. SPECIES CONC.

SECTION III PHYSICAL DATA

MW - 110.13

BOILING POINT °C
116

MELTING POINT °C
-111

SPECIFIC GRAVITY (H2O = 1)
0.997

SOLUBILITY IN WATER Prs/100 pts H2O
insoluble

APPEARANCE AND ODOR colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available

METHOD USED

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)

257-3425A
PRODUCT DESIGNATION
M-Fluorotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION
severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye and respiratory system irritation, severe digestive system attack, narcotic effect.

EFFECTS OF CHRONIC EXPOSURE
--

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid;
inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

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WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

GOGGLES

MECHANICAL (GENERAL)

GLOVES

RUBBER

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

with proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

257-3425B
## SECTION I Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer’s Name</th>
<th>Emergency Telephone No.</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
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<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-Fluorotoluene</td>
<td>O-Fluoromethylbenzene</td>
<td>( CH_3C\text{H}_2F )</td>
</tr>
</tbody>
</table>

## SECTION II Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % Wt. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀ Oral</th>
<th>LC₅₀ Percut.</th>
<th>Species</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
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<th>LD₅₀ Oral</th>
<th>LC₅₀ Percut.</th>
<th>Species</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>none available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## SECTION III Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>110.13</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>114°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-80°C</td>
</tr>
<tr>
<td>Specific Gravity (( H_2O = 1 ))</td>
<td>1.004</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Appearance and Odor</td>
<td>Colorless liquid</td>
</tr>
</tbody>
</table>

## SECTION IV Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>none available</td>
</tr>
<tr>
<td>Method Used</td>
<td>Flammable (Explosive) Limits</td>
</tr>
<tr>
<td>Extinguishing Media</td>
<td>Alcohol foam, carbon dioxide, dry chemical.</td>
</tr>
<tr>
<td>Special Fire Fighting Procedures</td>
<td></td>
</tr>
<tr>
<td>Unusual Fire and Explosion Hazards</td>
<td></td>
</tr>
</tbody>
</table>
PRODUCT DESIGNATION
0-Fluorotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC NO

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye and respiratory system irritation, severe digestive system irritation, narcotic effect.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE

goggles

GLOVES

rubber

MECHANICAL (GENERAL)

SPECIAL

HAZARDOUS RESPIRATORY PROTECTION

MISPRINTER

with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

257-3455B
# Material Safety Data Sheet

## Section I: Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trade Name and Synonyms</th>
<th>Chemical Name and Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P-Fluorotoluene</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Formula</th>
<th>Physical Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH₃CF₂</td>
<td></td>
</tr>
</tbody>
</table>

## Section II: Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or Vol.</th>
<th>Established OSHA Standard</th>
<th>LD₅₀</th>
<th>LC₅₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD₅₀ parenteral - mouse</td>
<td>500 mg/kg</td>
<td>none available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Section III: Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>117°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td></td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.001</td>
</tr>
</tbody>
</table>

Solubility in water: Insoluble.

**Appearance and Odor**: Colorless liquid, odor of oil of bitter almonds.

## Section IV: Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>None available</td>
</tr>
</tbody>
</table>

**Method Used**: Dry chemical, carbon dioxide, alcohol foam.

**Extinguishing Media**

**Special Fire Fighting Procedures**

**Unusual Fire and Explosion Hazards**
PRODUCT DESIGNATION
P-Fluorotoluene

SECTION V HEALTH HAZARD DATA

TOXIC level
none available

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

CARCINOGENIC
no

SKIN AND EYE IRITATION
severe

RELEVANT SYMPTOMS OF EXPOSURE
Eye and respiratory system irritation, severe digestive system irritation, narcotic effect.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPIIILED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)
EYE

YUGGLES

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

with proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

257-3485B
# Material Safety Data Sheet

**Product Designation:**
Formaldehyde 03-257-3965 (Liquid)

## Source and Nomenclature

<table>
<thead>
<tr>
<th>Manufacturer's Name</th>
<th>Emergency Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Address (Number, Street, City, State, Zip Code)</th>
<th>TRADE NAME AND SYNONYMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical Name and Synonyms</th>
<th>Chemical Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanal</td>
<td>HCHO</td>
</tr>
</tbody>
</table>

## Hazardous Ingredients

<table>
<thead>
<tr>
<th>Basic Material</th>
<th>Approximate or Maximum % WT. or VOL.</th>
<th>Established OSHA Standard</th>
<th>LD50 mg/kg</th>
<th>LC50 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Guinea Pig</td>
<td>Rat</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>260</td>
<td>800</td>
</tr>
</tbody>
</table>

Notes: Lowest published toxic concentration in air; inhalation - human 13.8 ppm. irritant
Lowest published lethal dose, oral - woman 36 mg/kg.
LDLO - oral - human 500 mg/kg

## Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point</td>
<td>98°C</td>
</tr>
<tr>
<td>Melting Point</td>
<td>0°F</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.08</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>volatile</td>
</tr>
</tbody>
</table>

Appearance and Odor:
Colorless gas with highly irritating odor or clear water white liquid.

## Fire and Explosion Hazard Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>122°F (15%-MeOH free) 185°F (37% - Methanol free)</td>
</tr>
</tbody>
</table>

Method Used:
Alcohol foam, carbon dioxide, dry chemicals, water spray.

Special Fire Fighting Procedures:
Wear goggles and self-contained breathing apparatus.

## Unusual Fire and Explosion Hazards

<table>
<thead>
<tr>
<th>Compound</th>
<th>Flammable Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upper 73%</td>
</tr>
<tr>
<td></td>
<td>Lower 7%</td>
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</table>

UCN:11322
(3 10-74)

257-3965A
PRODUCT DESIGNATION
Formaldehyde

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 2 ppm, 3 mg/C.M. (ceiling value)

Carcinogenic Neoplastic Effects

SECTION V HEALTH HAZARD DATA

Carcinogenic Neoplastic Effects

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Perchloric acid & aniline

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

bsorb on paper towels; evaporate in hood.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL
RESPIRATOR
W/appropriate filter

OTHER PROTECTIVE EQUIPMENT
Self-contained breathing apparatus; rubber apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Separate from oxidizing & alkaline materials outside storage preferred. Inside storage in flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

250-3965B
PRODUCT DESIGNATION

03-257-4025
Formamide

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL NAME AND SYNONYMS

Methanamide

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE OR MAXIMUM % WT. OR VOL.

ESTABLISHED OSHA STANDARD

LD$_{50}$ mg/kg

LC$_{50}$

ORAL PERCUT. SPECIES CONC.

Intramuscular - guinea pig

ID$_{50}$ 2539 mg/kg.

SECTION III PHYSICAL DATA

MW = 45.04

BOILING POINT

°F.

at 130°C

mm Hg.

211°C

VAPOR PRESSURE

2.6°C

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H$_2$O = 1)

1.13

SPECIFIC GRAVITY (H$_2$O = 1)

EVAPORATION RATE (-------)

VOLATILE

% Vol.

% WT.

SOLUBILITY IN WATER

very soluble

APPEARANCE AND ODOR

Colorless, hygroscopic, oily, liquid, odorless

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

°F.

310°F

METHOD USED

(COC)

EXTINGUISHING MEDIA

Water, alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322

(3 10-74)

257-4025A
PRODUCT DESIGNATION

Formamide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 20 PPM, 30 mg/kg.

Teratogen CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Drowsiness, fatigue, nausea, acidosis, skin eruptions.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - induce vomiting, get medical aid;
inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE googles

MECHANICAL (GENERAL)

GLOVES rubber

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Stored in closed container away from moisture.

OTHER PRECAUTIONS

SIGNATURE

DATE

257-4025B
PRODUCT DESIGNATION
03-257-4405
Formanilide

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
Phenylformamide

FORMULA
C₉H₁₀NCHO

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL

APPROXIMATE
% WT. OR VOL.

ESTABLISHED
OSHA STANDARD

LD₅₀

LC₅₀

LDLO - oral - dog 400 mg/kg

SECTION III PHYSICAL DATA

MW = 121.13

BOILING POINT
271° C

MELTING POINT
50° C

SPECIFIC GRAVITY (H₂O = 1)
1.15

SOLUBILITY IN WATER
slightly soluble

APPEARANCE AND ODOR
crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT
none available

METHOD USED

EXTINGUISHING MEDIA
Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

UCN-11322
(3 10-74)
PRODUCT DESIGNATION
Formanilide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust, ingestion

SKIN AND EYE IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Cyanosis, headache, dizziness, confusion, blood pressure
drop, convulsions and coma.

EFFECTS OF CHRONIC EXPOSURE
Weight loss, anemia, weakness and irritability

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid;
inhalation - give oxygen as needed; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

Goggles

SPECIAL

Gloves

OTHER PROTECTIVE EQUIPMENT

Respirator with proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

257-4405B
**SECTION I  SOURCE AND NOMENCLATURE**

<table>
<thead>
<tr>
<th>MANUFACTURER'S NAME</th>
<th>EMERGENCY TELEPHONE NO.</th>
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<tr>
<th>TRADE NAME AND SYNONYMS</th>
<th>CHEMICAL FAMILY</th>
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<tbody>
<tr>
<td>Trans-Butenedioyl chloride</td>
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<thead>
<tr>
<th>CHEMICAL NAME AND SYNONYMS</th>
<th>FORMULA</th>
</tr>
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</table>
| Fumaryl chloride            | (ClOCCH)

**SECTION II  HAZARDOUS INGREDIENTS**

<table>
<thead>
<tr>
<th>BASIC MATERIAL</th>
<th>APPROXIMATE OR MAXIMUM % WT. OR VOL.</th>
<th>ESTABLISHED OSHA STANDARD</th>
<th>LD50</th>
<th>LC50</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Lowest published lethal concentration in air</td>
<td>inhalation - rat 3000 mg/C.M.</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>ICTO - inhalation mouse 1000 mg/C.M./10 minutes</td>
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<table>
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<tr>
<th>HAZARDOUS INGREDIENTS</th>
<th>ESTAB</th>
<th>ABU</th>
<th>STAD</th>
<th>DEL</th>
<th>CON</th>
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</thead>
<tbody>
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<td></td>
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</table>

**SECTION III  PHYSICAL DATA**

<table>
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<tr>
<th>MW</th>
<th>153</th>
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<tbody>
<tr>
<td>BOILING POINT</td>
<td>°F</td>
</tr>
<tr>
<td>160</td>
<td></td>
</tr>
<tr>
<td>MELTING POINT</td>
<td>°F</td>
</tr>
<tr>
<td>SPECIFIC GRAVITY (H2O = 1)</td>
<td></td>
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<tr>
<td>1.408</td>
<td></td>
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<tr>
<td>SOLUBILITY IN WATER</td>
<td>Volts/100 Volts H2O</td>
</tr>
<tr>
<td></td>
<td>decomposes in water</td>
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</table>

<table>
<thead>
<tr>
<th>APPEARANCE AND ODOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear, straw-colored liquid, pungent odor, fumes in moist air.</td>
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</table>

**SECTION IV  FIRE AND EXPLOSION HAZARD DATA**

<table>
<thead>
<tr>
<th>FLASH POINT</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
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</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>UPPERO</td>
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</tbody>
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<table>
<thead>
<tr>
<th>EXTINGUISHING MEDIA</th>
<th>FLAMMABLE (EXPLOSIVE) LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol foam, carbon dioxide, dry chemical. Keep away from water.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL FIRE FIGHTING PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reacts with water or steam to produce HCl.</td>
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</table>

**UNUSUAL FIRE AND EXPLOSION HAZARDS**

| UCN-11322 (3 10-74) | 257-5405A |
PRODUCT DESIGNATION

Fumaryl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

Carcinogenic no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE

Cyanosis, coughing, headache, pulmonary edema,
ulceration of skin, dizziness.

EFFECTS OF CHRONIC EXPOSURE

Erosion of teeth, jaw necrosis, lung irritation
and cough.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - drink water, milk
of magnesia, get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

dimethyl sulfoxide.

HAZARDOUS DECOMPOSITION PRODUCTS

Evolution of phosgene when heated.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES)

EYE goggles

MECHANICAL (GENERAL)

GLOVES rubber

SPECIAL RESPIRATOR with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE DATE

257-5405B
MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

Manufacturer's Name

Emergency Telephone No.

Address (Number, Street, City, State, Zip Code)

Trade Name and Synonyms

Chemical Name and Synonyms

Chemical Family

Formula

SECTION II HAZARDOUS INGREDIENTS

Basic Material

Approximate or Maximum % WT. or VOL.

Established OSHA Standard

LD50 mg/kg ORAL PERCUT. SPECIES CONC.

LC50

LCLO - Inhalation - human .6 mg/CM - eye

127 rat

400 mouse

2300 dog

928 rabbit

541 guinea pig

LCLO - Oral - human 500 mg/CM

SECTION III PHYSICAL DATA

Boiling Point

°C

°F.

Vapor Pressure

mm Hg.

Melting Point

°C

°F.

Vapor Density (Air = 1)

3.31

Specific Gravity (H2O = 1)

1.16

Evaporation Rate (Air = 1)

Solubility in Water Pts/100 pts H2O

Slightly Soluble

Appearance and Odor

Colorless to yellow liquid, almond-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point

140°F

Method Used

C.C.

Extinguishing Media

Alcohol foam, carbon dioxide, dry chemical

Special Fire Fighting Procedures

Unusual Fire and Explosion Hazards
PRODUCT DESIGNATION
Furfural

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 5 PPM, 20 mg/C.M. (Skin) CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE IRRITATION Slight to moderate

RELEVANT SYMPTOMS OF EXPOSURE Weakness, pulmonary edema, headache, numbness of tongue and mucous membrane, dermatitis.

EFFECTS OF CHRONIC EXPOSURE
Liver damage

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Avoid contact with strong mineral acids or alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST
MECHANICAL (GENERAL)
SPECIAL

PROTECTIVE EQUIPMENT (SPECIFY TYPE)
Goggles
Gloves
Respirator
Self-contained

OTHER PROTECTIVE EQUIPMENT
Full protective clothing

SECTION IX SPECIAL PRECAUTIONS
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside storage preferred, protect against physical damage by shock.

OTHER PRECAUTIONS

SIGNATURE DATE

257-5905B
PRODUCT DESIGNATION
03-257-7905
Furoyl chloride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER’S NAME
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)
TRADE NAME AND SYNONYMS
CHEMICAL NAME AND SYNONYMS
Furoyl chloride

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL
APPROXIMATE OR MAXIMUM % WT. OR VOL.
ESTABLISHED OSHA STANDARD
LD₅₀ ORAL PERCU. SPECIES CONC.
LC₅₀ none available

SECTION III PHYSICAL DATA

MW - 130.53

BOILING POINT 176°C 0°F.
MELTING POINT -2°C 0°F.
SPECIFIC GRAVITY (H₂O = 1) decomposes
SOLUBILITY IN WATER Pts/100 pts H₂O VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available
METHOD USED
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical
SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS
reacts with water or steam.

257-7905A
PRODUCT DESIGNATION
Furfoyl chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC
NO

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of eyes and respiratory system; if swallowed - severe digestive tract attack; eye and skin burns.

EFFECTS OF CHRONIC EXPOSURE
Bronchial irritation, erosion of teeth

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - drink water, milk of magnesia, get medical aid; inhalation - rest; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
May react violently with water or alcohol

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
Self-contained

OTHER PROTECTIVE EQUIPMENT
rubber apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

257-7905B
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<tr>
<th>Organic</th>
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