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(Volume I)

Materials Safety Data Sheets The Basis for Control of Toxic Chemicals Volume I

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E. E. Ketchen
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C. L. Hunt

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OAK RIDGE NATIONAL LABORATORY

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HEALTH DIVISION
Industrial Hygiene Department

MATERIALS SAFETY DATA SHEETS
THE BASIS FOR CONTROL OF TOXIC CHEMICALS

VOLUME I

N. E. Bolton
E. E. Ketchen
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C. L. Hunt

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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. As such, they are a valuable adjunct to the data cards issued with specific chemicals. Chemicals are identified by name and Stores number, where appropriate.

These 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 necessitated the use of descriptive medical terms. A glossary was developed to define some of these sometimes unfamiliar terms. Questions concerning these data sheets should be directed to the Industrial Hygiene Department.

The most appropriate introduction to the information presented in the following pages is to quote R. E. Eckhardt, M.D., Ph.D., F.A.C.P., from his book entitled Industrial Carcinogens, dated 1959: It seems axiomatic that if a man is to protect himself from a hazard, he must be informed of the nature of the hazard from which he is protecting himself.

T. A. Lincoln, Director
Health Division

N. E. Bolton
Industrial Hygiene Department
Health Division

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(To be continued in ORNL TM 5722)

A SYSTEM FOR LABELING AND CONTROL OF
TOXIC MATERIALS IN A LARGE RESEARCH FACILITY*

W. E. Porter, C. L. Hunt, Jr., and N. E. Bolton

Abstract

For large industrial and research operations, maintaining reasonable control of all toxic materials used in their operations can be a formidable task. A system utilizing cards has been developed that serves a dual purpose — informing the user regarding hazards of a particular material and also facilitating appropriate workplace surveillance during its use. Selected data, including threshold limit values, routes of absorption, symptoms of exposure, chronic effects, and emergency first-aid procedures, are printed on the card. A portion of the card contains the label that the user detaches and affixes to the container. This label classifies the material according to flammability, toxicity, reactivity, and special properties on a 0 through 4 hazard rating system.

This report describes the development and use of such cards, contains the associated Toxic Material Data Sheets that provide full backup data for the labels, and furnishes a glossary of biomedical terms used in the Data Sheets.

* Presented as "A System for Labeling and Control of Toxic Materials in a Large Research Facility" at Amer. Ind. Hygiene Conf., Miami, May 12-17, 1974. Also published under the same title in Amer. Ind. Hygiene Journal

1. Control of Toxic Materials

Introduction and Background

The widely divergent activities of most research laboratories make it impossible for those responsible for industrial hygiene to anticipate the use of every toxic chemical and to monitor appropriately each and every operation involving such a chemical. Obviously then, the user must have some knowledge of the toxicity of the material he uses in order to take the precautions necessary to work safely.

There are approximately 1300 chemicals, the bulk of which have significant toxic properties, stocked in the Oak Ridge National Laboratory Chemical Stores. All of these are available to any one of some 4000 employees upon presentation of a charge-account number.

Several years ago, a program was developed to identify and label the more-toxic chemicals routinely used at ORNL. Of the 1300 chemicals, some 70 toxic materials were investigated, and appropriate labels were designed and produced. The primary purpose of this system was to call attention to the fact that a chemical was capable of producing some kind of toxic response. In this system chemicals were assigned a toxic index of 4 (extremely toxic) or 5 (super toxic). The individual labels did not bear the names of the specific chemicals to which they would be attached. The responsibility for affixing the label with the appropriate toxic-index number rested entirely on the Stores clerks. The program was only marginally successful and was abandoned after eighteen months, for two reasons: (1) lack of adequate manpower and (2) the logistics of ensuring that the proper label was placed on each chemical.

Several inquiries were made of chemical manufacturers and suppliers

to determine their plans, if any, for the prelabeling of chemicals. It was learned that few states have laws requiring suppliers to label chemicals and that most manufacturers had no intention of using any toxic-index labeling system until a uniform federal code was adopted.

While there was a need for a labeling system utilizing a health-hazard-index scheme, it was felt that at ORNL a mechanism enabling closer industrial hygiene surveillance and control was even more important. Adequate control of toxic chemicals depends on knowing before the fact what chemical is being handled, by which employees, and in what manner. Even if a uniform code existed for prelabeling by manufacturers, a mechanism for notifying the Industrial Hygiene Department would still be essential. Past efforts to evaluate and document potential exposures were of only marginal value mainly because the presence of a toxic chemical was not known until well after its use.

The Laboratory has some 27 divisions involved in basic research and support services in biology, chemistry, engineering, environmental sciences, mathematics, physics, radiological health, etc. With such a potpourri of research, one can expect to find almost any possible chemical entity in use at some time at the Laboratory. Further complicating the problem of industrial-hygiene surveillance are the following facts: (1) there are approximately 90 buildings housing personnel (both research and service); (2) these buildings enclose some 1.3 million square feet of working floor space; and (3) they are scattered over approximately 1800 acres, with several miles separating tracts of acreage. To overcome these and other difficulties, a combined labeling system was developed for toxic chemicals.

Mechanics of the System

Chemicals are classified as to toxicity, flammability, reactivity, and

special properties on hazards indices of 0 through 4.^{1,2,3} Since the primary concern in industrial hygiene is protection of the employee from stresses and insults that may cause untoward health effects, only those chemicals that present a significant potential health hazard are classified and included in the control program as described. Chemicals that are of importance only because of properties of flammability or reactivity have been omitted. These may be included at some later time. The health-hazard index is listed below:

Degree 4: extremely toxic

Degree 3: highly toxic

Degree 2: moderately toxic

Degree 1: slightly toxic or practically nontoxic

Degree 0: relatively harmless

The toxicity ratings are determined on the basis of the danger presented by entry through any of the three most common portals to the body - the skin, the respiratory tract, and the gastrointestinal tract. The relative-toxicity criteria^{1,3} are shown in Table I. However, threshold-limit values (TLV's)⁴ were used in preference to these criteria whenever possible. No claim is made as to the validity of the TLV ranges, which are shown in Table II. They were selected more or less arbitrarily by mutual agreement of several industrial hygienists. Materials that have TLV's expressed both in parts per million and milligrams per cubic meter were classified according to the parts-per-million concentration since this always placed them in the more-toxic category.

Where none of these specific criteria can be identified, chemicals must be classified using whatever toxicological data are currently available. Frequently, the rate of synthesis of new chemical compounds is so rapid that there are no data obtainable on the chemical's relative toxicity. In such cases, estimates are made from data on analogues. Because of staff and time

limitations, only materials classified as 3 or 4 have been included initially.

Selected toxicological data are printed on 7 1/2 by 3 1/3-in. cards--the approximate size of the standard computer keypunch card. An example of this card is shown in Fig. 1. These cards are placed in the Stores bins alongside the regular Stores issue cards. When a withdrawal is made, the control card is issued with each unit of a particular chemical. This card is signed by the user, indicating he has read and understands the information. The reverse side of the card, shown in Fig. 2, is completed by the user and returned to the Industrial Hygiene Department for review. It is essential that some individual who will be directly involved in the operation utilizing the particular chemical complete the card. Based on this information, the need for a site visit by a representative of the Industrial Hygiene Department is determined. If a significant potential for exposure is believed to exist, appropriate monitoring programs and/or control measures are instituted. Clearly, a variety of analytical techniques and control measures are required by the variety of chemicals available in ORNL Stores. Of course, samples for bioassay are obtained, when appropriate, to estimate employee exposure.

The tear-off section of the two-part card in Fig. 2 contains the label.^{2,3} This color-coded label, approximately 1 1/2 by 3 1/2 in. with a self-adhesive back, is affixed by the individual breaking the seal on the container. In many respects this approach is superior to prelabeling by the chemical manufacturer, since the responsibility for labeling is placed on the user and serves to emphasize the toxicity of the chemical in question.

Periodically, the information on the completed cards that are returned to the Industrial Hygiene Department is crosschecked against Stores issue cards covering the same period. This is an administrative procedure to ensure that the control system is functioning as designed. A sample printout sheet from this computer crosscheck, known as the Reconciliation Report, is shown in Fig. 3.

Control cards are computer-printed, and the supply for the Stores bins automatically replenished on a monthly frequency. Replenishment numbers are determined from items received in Stores each month. The program is completely flexible, allowing for the addition of new chemicals, deletion when desired, and alteration of any part of the toxicological or labeling data.

Results and Discussion

All site surveys that result from information on control cards returned to the Industrial Hygiene Department are documented by a memo to the file for toxic chemicals. In addition, records of all monitoring data and exposure assessment are maintained. For this purpose, two computer programs have been developed: one for storage of air-monitoring data and related personnel information and one for storage of all biological-sampling data. The latter data are stored separately since they are, in effect, part of the employee's medical record.

The form shown in Fig. 4 is used to record and submit for computer processing all sampling data pertaining to individual workers. A printout, an example of which is shown in Fig. 5, is issued at regular intervals. The most-significant feature of this program is the ability to request and receive a printout of the potential-exposure history of any employee for which air-monitoring data have been collected. These data are also retrievable by chemical (air contaminant), building, department, etc.

The need to maintain records and to document exposure history for individual workers has resulted in a significant increase in workroom sampling for specific toxic materials and chemicals. Breathing-zone-concentrations must be determined, and sufficient exposure-time data must be recorded to permit the calculation of an 8 hr time-weighted average exposure for the workers involved.

Several problems have been encountered since the system was put into

operation in January of 1974. Undoubtedly, the most troublesome problem has been the difficulty experienced in informing and educating employees about the workings of the program. A bulletin was issued described in detail how the system functions, the responsibilities of employees, and the purpose of the control program. Divisional representatives were thoroughly briefed in preparation for answering questions from employees relative to details of the program. Still, compliance by employees has been far from complete. There are several possible explanations for this: (1) employees still are not aware of their responsibility for completing the cards and returning them to the Industrial Hygiene Department, (2) employees procrastinate or forget, (3) employees do not want to be bothered by industrial-hygiene reviews or surveys, (4) employees resent any attempts to monitor their activities related to use of toxic chemicals, and/or (5) employees feel that their knowledge of the toxic properties of chemicals is adequate to prevent excessive exposure.

Conclusions

The incorporation of this system into the Industrial Hygiene Program has dramatically increased both the number and variety of breathing-zone air samples being collected. This number will further increase as the system becomes better understood and accepted by Laboratory personnel and as more chemicals are classified and added to the program. Additional efforts toward education and the redirecting of attitudes will be required.

The system is proving useful because it serves to inform the Industrial Hygiene Department of an impending use of a toxic chemical. Refinements and adjustments will be necessary as experience is gained and as the program increases in scope.

Acknowledgments

The authors gratefully acknowledge the efforts of C.E. Williams in developing the programming and data-handling portion of our system.

Table 1. Relative-toxicity criteria

Commonly Used Term	LD ₅₀ , Simple Oral Dose, Rats (mg/kg)	Inhalation, 4-hr Vapor Exposure, Rats, Mortality of 2/6 to 4/6 ppm	LD ₅₀ , Skin, Rabbits (mg/kg)
Extremely toxic	≤ 1	≤ 10	≤ 5
Highly toxic	1.1 to 50	11 to 100	5.1 to 43
Moderately toxic	50.1 to 500	101 to 1,000	44 to 340
Slightly toxic or practically non- toxic	501 to 15,000	1,001 to 100,000	350 to 22,600
Relatively harmless	>15,000	>100,000	>22,600

Table 2. Relative-toxicity criteria based on TLV's

Commonly Used Term	TLV	
	ppm	mg/m ³
Extremely toxic	≤ 10	≤ 0.25
Highly toxic	11 to 250	0.26 to 2.5
Moderately toxic	251 to 500	2.51 to 5.0
Slightly toxic or practically non- toxic	501 to 1000	5.1 to 10
Relatively harmless	> 1000	> 10

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- Fig. 1. Front side of control card.
- Fig. 2. Reverse side of control card.
- Fig. 3. Printout sheet from reconciliation report.
- Fig. 4. Workplace sampling form.
- Fig. 5. Printout sheet from sampling history report (names omitted).

CATALOG NO. 03-227-4624
CHEMICAL - CARBON TETRACHLORIDE

CRNL (3)

CONTROL OF TOXIC CHEMICALS

OSHA THRESHOLD LIMIT VALUE

CARCINOGENIC

10 PPM

YES

PRINCIPLE ROUTES OF ABSORPTION

INHALATION OF VAPOR, INGESTION, AND SOMETIMES SKIN

ABSORPTION.

RELEVANT SYMPTOMS OF EXPOSURE

ABDOMINAL PAIN, NAUSEA, VOMITING, DIZZINESS, LOSS

OF BLOOD PRESSURE, RESPIRATORY SLOWING, AND FALL OF BLOOD PRESSURE.

EFFECTS OF CHRONIC EXPOSURE

LIVER AND/OR KIDNEY DAMAGE, LOSS OF APPETITE AND WE-

IGHT, DERMATITIS, LOSS OF MEMORY, AND ANOREXIA.

EMERGENCY AND FIRST AID PROCEDURES

REMOVE FROM EXPOSURE, IF NECESSARY GIVE ARTIFIC-

IAL RESPIRATION. DO NOT GIVE STIMULANTS. OBTAIN MEDICAL AID.

UNUSUAL HAZARDS

DELAYED LIVER OR KIDNEY SYMPTOMS. WHEN HEATED RELEASES PHOS-

GENE. AVOID CONTACT WITH ALUMINUM, ALKALIES, ALLYL ALCOHOL & BERYLLIUM

SIGNED

ORNL DWG. 74-4340

CARBON TETRACHLORIDE
FLAMMABILITY

0=HARMLESS

1=SLIGHT HAZARD

2=HAZARDOUS

3=HIGH HAZARD

4=EXTREM. HAZARD

Figure 1

ORNL DWG. 74-4338

THIS CARD MUST BE FILLED OUT BY PERSON USING CHEMICAL AND
RETURNED TO THE INDUSTRIAL HYGIENE DEPARTMENT IMMEDIATELY

CHEMICAL NUMBER	DIVISION	DATE
BUILDING	ROOM	QUANTITY
DESCRIPTION OF USE		
PHONE	NAME	

Figure 2

1-12

ORNL DWG. 74-4336

PAGE 14 ORNL TOXIC CHEMICALS USAGE RECONCILIATION REPORT 7010 04/05/74 TIME: 150625											
-----STORES USAGE INFORMATION----- ***** RETURNED FORM UCN-10736 *****											
ACCOUNT	WORK ORD	DESCRIPTION	UNIT	QTY.	DEPT.	BADGE	DATE	QTY.	UNIT	BLDG.	NAME
DIVISION 03 TOTAL (03-203-9202) -----				1	NO. ISSUES:	1		1	NO. DOCUMENTS RETURNED:	1	
CHEMICAL NO. TOTAL (03-203-9202) -----				7	NO. ISSUES:	3		1	NO. DOCUMENTS RETURNED:	1	
4455-65-0065		ACID TRICHLOROACETIC	BTL	4	4455	15203	02-27-74				
4455-65-0054		ACID TRICHLOROACETIC	BTL	8	4455	11927	02-27-74				
4455-65-0001		ACID TRICHLOROACETIC	BTL	1	4455	15448	03-01-74				
4455-65-0065		ACID TRICHLOROACETIC	BTL	6	4455	15203	03-06-74				
4455-65-0055		ACID TRICHLOROACETIC	BTL	6	4455	18755	03-06-74				
4455-65-0033		ACID TRICHLOROACETIC	BTL	18	4455	14113	03-15-74				
4455-65-0087		ACID TRICHLOROACETIC	BTL	6	4455	14929	03-20-74				
4455-65-0145		ACID TRICHLOROACETIC	BTL	6	4455	02944	03-22-74				
4455-65-0026		ACID TRICHLOROACETIC	BTL	6	4455	14045	03-22-74				
DIVISION 02 TOTAL (03-203-9262) -----				61	NO. ISSUES:	9		0	NO. DOCUMENTS RETURNED:	0	
CHEMICAL NO. TOTAL (03-203-9262) -----				61	NO. ISSUES:	9		0	NO. DOCUMENTS RETURNED:	0	
3390-65-0050		ANYL ACETATE	BTL	1	3390	12900	03-06-74	000001			03-06-74
DIVISION 01 TOTAL (03-212-5104) -----				1	NO. ISSUES:	1		1	NO. DOCUMENTS RETURNED:	1	
CHEMICAL NO. TOTAL (03-212-5104) -----				1	NO. ISSUES:	1		1	NO. DOCUMENTS RETURNED:	1	
3369-65-0002		BENZENE	BTL	1	3369	12961	03-19-74				
DIVISION 25 TOTAL (03-216-7006) -----				1	NO. ISSUES:	1		0	NO. DOCUMENTS RETURNED:	0	
3650-65-0003		BENZENE	BTL	12	3650	12431	03-12-74	000001			03-20-74
DIVISION 32 TOTAL (03-216-7006) -----				12	NO. ISSUES:	1		1	NO. DOCUMENTS RETURNED:	1	
CHEMICAL NO. TOTAL (03-216-7006) -----				13	NO. ISSUES:	2		1	NO. DOCUMENTS RETURNED:	1	
3390-65-0025		BENZENE#BENZOL#RACS	BTL	4	3390	07846	03-05-74				
3390-65-0025		BENZENE#BENZOL#RACS	BTL	4	3390	07846	03-26-74				
DIVISION 01 TOTAL (03-216-7036) -----				8	NO. ISSUES:	2		0	NO. DOCUMENTS RETURNED:	0	
CHEMICAL NO. TOTAL (03-216-7036) -----				8	NO. ISSUES:	2		0	NO. DOCUMENTS RETURNED:	0	
3390-65-0025		BENZENE	BTL	1	3390	10705	03-04-74	000001			03-13-74
3390-65-0040		BENZENE	BTL	1	3390	07874	03-13-74				

Figure 3

1-13

ORNL DWG. 74-4345

ORNL INDUSTRIAL HYGIENE WORKPLACE SAMPLING

1 SAMPLE NO.* 5		4 BUILDING 11		12 ROOM 16		17 AREA 21		DATE 22 MO DAY YR 27		26 TIME 31		32 SAMPLED BY (BADGE NO.) 42		79 80																																																			
00236														1 0																																																			
TYPE AP 82 AO SMEAR 6 7 8 9 10										SAMPLING DATA										79 80																																													
METHOD										29 30 DURATION 33 34										RATE										83 84		VOLUME 82		79 80																															
																																		2 0																															
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6 CONTAMINANT										30 31 CONCENTRATION 35 36										UNITS 40 41										COMMENTS										65 66		TLV 70		79 80																					
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8 DEPT. 9 10 P/R 11										BADGE										PERSON 21 22 IN AREA 23 SAMP 24										PERSONNEL DATA NAME										43 44										COMMENTS										63 64		79 80			
																																																																4 0	
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UCN-10957
(3 10-73)

* PUNCH SAMPLE NO. IN COLUMNS 1-5 OF ALL CARDS.

Figure 4

1-14

ORNL DWG. 74-4337

WORKPLACE SAMPLING HISTORY									
REPORT DATE 03/05/74					PAGE NO. 2		REPORT NO. 803811		
TYPE	METHOD	DURATION	RATE	VOLUME	CONTAMINANT	CONCENTRATION	UNITS	COMMENTS	TLV
82	DRAEGER TUBE				OZONE	0.3	PPM	ELECTRODE WELDING BLACK	0.1
82	DRAEGER TUBE				NITROGEN DIOXIDE	<0.1	PPM	IRON, GALVANIZED; MELIARC 5C	
82	8M MILLIPORE	10M	1.5 L/M	15L	ZINC	0.1	MG/M2	WELDING ALUMINUM	5
(TOTAL COMMENT APPLIES ON ALL THREE LINES)									
PERSONNEL DATA									
*****PERSON*****									
DEPT	PAYROLL	BADGE	IN AREA	SAMPLED	NAME	COMMENTS			
3063	M								
3088	M								
SAMPLING DATA									
SAMPLE NUMBER	BUILDING	ROOM	AREA	DATE OF SAMPLE	TIME OF SAMPLE	SAMPLED BY (BADGE NUMBER)			
00137	4508	253		10-15-73	1330	15614			
TYPE	METHOD	DURATION	RATE	VOLUME	CONTAMINANT	CONCENTRATION	UNITS	COMMENTS	TLV
82	DRAEGER TUBE				PERCHLOROETHYLENE	0	PPM	FUEL ELEMENTS DIPPED IN OPEN RESERVOIR OF PERCHLOROETHYLENE (ENTIRE COMMENT APPLIES)	100
PERSONNEL DATA									
*****PERSON*****									
DEPT	PAYROLL	BADGE	IN AREA	SAMPLED	NAME	COMMENTS			
				X					
SAMPLING DATA									
SAMPLE NUMBER	BUILDING	ROOM	AREA	DATE OF SAMPLE	TIME OF SAMPLE	SAMPLED BY (BADGE NUMBER)			
00140	7005			11-13-73	0200	15451			
TYPE	METHOD	DURATION	RATE	VOLUME	CONTAMINANT	CONCENTRATION	UNITS	COMMENTS	TLV
SNEAR	WHATMAN 41-1 FT2				LEAD	0.257	MG	LEDGE	
SNEAR	WHATMAN 41-1 FT2				LEAD	0.494	MG	CONDUIT	
SNEAR	WHATMAN 41-1 FT2				LEAD	0.344	MG	CONDUIT	
SNEAR	WHATMAN 41-1 FT2				LEAD	0.026	MG	LEDGE	
SNEAR	WHATMAN 41-1 FT2				LEAD	0.312	MG	WALL	
SNEAR	WHATMAN 41-1 FT2				LEAD	0.385	MG	WALL	
SNEAR	WHATMAN 41-1 FT2				LEAD	1.635	MG	LEDGE	
PERSONNEL DATA									
*****PERSON*****									
DEPT	PAYROLL	BADGE	IN AREA	SAMPLED	NAME	COMMENTS			
3016	M								
3016	M								
3016	M								

Figure 5

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2. GLOSSARY OF TERMS

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GLOSSARY

Albumin	A water-soluble protein excreted in urine
Anemia	A condition in which the blood is deficient in hemoglobin and/or numbers of red cells compared with normal blood
Anesthesia	Loss of feeling or sensation, especially the loss of tactile sensibility
Anorexia	Lack or loss of the appetite for food
Anosmia	Absence of the sense of smell
Anuria	Total suppression of urinary output by the kidney
Apathy	Lack of feeling or emotion, indifference
Arthralgia	Neuralgia or pain in a joint
Asbestosis	Lung disease caused by prolonged inhaling of asbestos
Asphyxia	Suffocation
Bronchiolitis	Capillary bronchitis
Bronchitis	Inflammation of the bronchial tubes
Bronchopneumonia	Inflammation of the lungs following infection of the upper respiratory tract, infectious fevers, or debilitating diseases
Bronchospasms	Bronchial spasm
Carcinoma	A malignant new growth made up of epithelial cells, which give rise to metastases
Cataract	An opacity of the crystalline eye lens or its capsule
Cirrhosis	A disease of the liver marked by the progressive destruction of liver cells
Conjunctivitis	Inflammation of the conjunctiva, the delicate membrane that lines the eyelids and covers the eyeballs

Convulsion	A violent contraction of the voluntary muscles
Cornea	Transparent structure of the external layer of the eyeball
Cyanosis	Blueness of the skin caused by insufficient oxygenation of the blood
Delirium	A mental disturbance marked by illusion, hallucinations, physical restlessness, and incoherence
Dermatitis	Inflammation of the skin
Dyspnea	Difficult or labored breathing
Emphysema	A swelling or inflation due to presence of air in the interstices of the connective tissues of the lungs
Epigastric	Pertaining to the belly or (epigastrium)
Erosion	An eating or gnawing away
Euphoria	Exaggerated sense of well being
Gangrene	Anemic necrosis of tissue
Gastroenteritis	Inflammation of the stomach and intestines
Goiters	Enlargement of the thyroid gland
Hallucinations	A sense perception not founded upon objective reality
Hematemesis	Vomiting of blood
Hematuria	Discharge of blood in the urine
Hemoglobinuria	Presence of hemoglobin in the urine
Hemolytic Anemia	Anemia due to active destruction of red cells
Hepatitis	Inflammation of the liver
Hyperactivity	Overactivity
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
Laryngitis	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
Somnolence	Sleepiness
Stomatitis	Inflammation of the mouth
Stupor	Partial or nearly complete unconsciousness

Thiocyanate intoxication

Characterized by central nervous system stimulation and depression, and muscular incoordination

Tinnitus

Ringing in the ears

Ulceration

The formation of an ulcer

Vertigo

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

3. Material Safety Data Sheets

PRODUCT DESIGNATION

03-206-7501
Acetyl ureaMATERIAL 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

Acetyl urea

FORMULA $\text{CH}_3\text{CONHCONH}_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note			See	note		
Lowest published lethal dose						
Oral - rat 10 mg/Kg.						

SECTION III PHYSICAL DATA MW - 102.09

BOILING POINT Sublimes at 190°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 218°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 2		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Needle-like crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Acetyl Urea

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Slight

RELEVANT SYMPTOMS OF EXPOSURE

Dermatitis

EFFECTS OF CHRONIC EXPOSURE Depression of bone marrow, anemia, allergic skin eruptions.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - induce vomiting, get medical aid; inhalation - rest; wash from 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

See dimethyl acetamide

PRODUCT DESIGNATION

03-206-4501
Acetyl Methyl AmineMATERIAL 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

Methyl Acetamide
CHEMICAL NAME AND SYNONYMS

FORMULA

Acetyl-Methyl amine

 $\text{CH}_3\text{CONHCH}_3$

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 - 73.1

BOILING POINT 206°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 31°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) Not available		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Very soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Colorless, needle-like crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED Not available		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Acetyl Methyl amine

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

Jaundice, drowsiness, fatigue, nausea

EFFECTS OF CHRONIC EXPOSURE

Liver damage

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - induce vomiting, 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

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-211-3103 Allylamine

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
2 Propenylamine, Allylamine	CH ₂ CHCH ₂ NH ₂

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
					Rat	286
			106		Rat	
				35	Rabbit	
			57		Mouse	

SECTION III PHYSICAL DATA	
BOILING POINT ° F. 53.2°C MELTING POINT ° F. SPECIFIC GRAVITY (H ₂ O = 1) 0.716 SOLUBILITY IN WATER Pts/100 pts H ₂ O 00 APPEARANCE AND ODOR Colorless liquid	MW - 59.07 VAPOR PRESSURE mm Hg. VAPOR DENSITY (Air = 1) 2.00 EVAPORATION RATE (_____ = 1) VOLATILE % Vol. % Wt. 00

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
-20°F		22% 2.2%
METHOD USED		

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical, water spray

SPECIAL FIRE FIGHTING PROCEDURES
Water may be ineffective - wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS
When heated to decomposition temperature, emits fumes.

PRODUCT DESIGNATION
Allylamine

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
Irritation of mucous membranes of eyes, nose and mouth

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES Wash from eyes and skin; if swallowed - wash mouth, drink water, get medical aid; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Reacts with 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	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
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PRODUCT DESIGNATION

03-211-3203
Allyl bromideMATERIAL 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

3 Bromopropene, Allyl Bromide

FORMULA

 $\text{CH}_2\text{CHCH}_2\text{Br}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			Not available			

SECTION III PHYSICAL DATA MW - 121.0

BOILING POINT 71.3°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -119.4°C	° F.	VAPOR DENSITY (Air = 1) 4.2
SPECIFIC GRAVITY (H ₂ O = 1) 1.8		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O No		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid, unpleasant odor		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
300 F		7.3
METHOD USED		LOWER
Alcohol foam		4.4
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Allyl bromide

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

Irritation of eyes, skin and respiratory tract

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES

Wash skin & eyes if swallowed - wash mouth, induce vomiting, get medical aid, inhalation - rest; keep warm.

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

PRODUCT DESIGNATION

03-212-0104
2-Amino-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 2,5 dimethyl aniline	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 2,5 xylidine, 2-amino-1, 4-Dimethylbenzene	FORMULA (CH ₃) ₂ C ₆ H ₃ NH ₂

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.
			1297		Rat	
			841		Mouse	

SECTION III PHYSICAL DATA MW-121.18

BOILING POINT 215°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 16°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 0.98		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Very slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Red to dark brown liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 206°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2 amino-1,4-Dimethylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 5 PPM, 25 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

slight

REVELANT SYMPTOMS OF EXPOSURE

Headache, drowsiness, cyanosis, mental confusion,

convulsions, central nervous system depression

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage, fatigue, loss of appetite

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

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-212-0134
4 amino - 1,3-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

2,4 Xylidine

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2,4 Dimethyl aniline, 4 amino-1, 3 Dimethylbenzene (CH₃)₂C₆H₃NH₂

FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			467		Rat	
			250		Mouse	

SECTION III PHYSICAL DATA

MW-121.18

BOILING POINT

° F.

214°C

VAPOR PRESSURE

mm Hg.

at 104°C

12

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

0.98

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

Very slightly soluble

APPEARANCE AND ODOR

Red to dark brown liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

206°F

FLAMMABLE
(EXPLOSIVE)

UPPER

METHOD USED

LIMITS

LOWER

C.C.

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
4 amino, - 1,3 Dimethylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 5 PPM, 25 mg/C.M. CARCINOGENIC no

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

REVELANT SYMPTOMS OF EXPOSURE Headache, drowsiness, cyanosis, mental confusion,
convulsions, central nervous system depression

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage, fatigue, loss of appetite

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

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
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PRODUCT DESIGNATION
03-212-0164
5-amino-1,3-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 3,5 Dimethylaniline	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 3,5 Xylidine, 5 amino-1, 3-Dimethylbenzene	FORMULA (CH ₃) ₂ C ₆ H ₃ NH ₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			707		Rat	
			421		Mouse	

SECTION III PHYSICAL DATA MW-121.18

BOILING POINT 220°C	° F.	VAPOR PRESSURE at 105°C	mm Hg. 14
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.97		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Very slightly soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Pale brown crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 206°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED CC		LOWER
EXTINGUISHING MEDIA Foam, Carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
5 amino - 1,3 Dimethylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 5 PPM, 25 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE IRRITATION slight

REVELANT SYMPTOMS OF EXPOSURE
Headache, drowsiness, cyanosis, montal confusion, convulsions, central nervous system depression

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage, fatigue, loss of appetite.

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 <u>Goggles</u>
MECHANICAL (GENERAL)	GLOVES <u>Rubber</u>
SPECIAL	RESPIRATOR <u>With proper filter</u>
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE	DATE
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PRODUCT DESIGNATION

03-212-0204
O-aminodiphenyl

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
O-aminobiphenyl CHEMICAL NAME AND SYNONYMS O-aminodiphenyl	FORMULA $\text{NH}_2\text{C}_6\text{H}_4 - \text{C}_6\text{H}_5$

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 - 169.23

BOILING POINT 299°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 52°C	° F.	VAPOR DENSITY (Air = 1) 5.8
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Leaf-like crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Carbon-dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

O-aminodiphenyl

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 Mucous membrane & skin irritation, cyanosis & jaundice.

EFFECTS OF CHRONIC EXPOSURE

Bladder cancer

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give emetic, get medical aid;
inhalation - 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

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

PRODUCT DESIGNATION

03-212-1704
2-Aminopyridine

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 aminopyridine

FORMULA

 $C_5H_6N_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			200		Rat	
			See Note			
Note:						
Lowest published toxic concentration in air						
Inhalation human - 5 PPM/5 hrs.						

SECTION III PHYSICAL DATA MW - 94.11

BOILING POINT 210.6°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 58°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 5		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR White powder or crystals.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical
water may be ineffective.

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

UNUSUAL FIRE AND EXPLOSION HAZARDS When heated to decomposition, it emits
highly toxic fumes.

PRODUCT DESIGNATION

2-aminopyridine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.5 PPM, 2 mg/C.M.

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Skin, inhalation, ingestion

SKIN AND EYE

IRRITATION

Moderate

RELEVANT SYMPTOMS OF EXPOSURE Headache, increased blood pressure, nausea, convulsions, respiratory failure.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - remove from exposure, rest, artificial respiration as needed, get medical aid; 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

Rubber

SPECIAL

RESPIRATOR

Self-contained respirator

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-609-2050 03-609-2075 Asbestos Fiber
--

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	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
#1 lowest published toxic dose inhalation - human 1.2 fibers 1 CC			See Note 1		

SECTION III PHYSICAL DATA	
BOILING POINT N/A ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT N/A ° 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 Grey-white fibers	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT Not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA N/A		
SPECIAL FIRE FIGHTING PROCEDURES N/A		
UNUSUAL FIRE AND EXPLOSION HAZARDS N/A		

PRODUCT DESIGNATION

Asbestos Fibers

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

5 fibers/CC >5 μ long

CARCINOGENIC yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation

SKIN AND EYE

IRRITATION No

RELEVANT SYMPTOMS OF EXPOSURE

None

EFFECTS OF CHRONIC EXPOSURE

Asbestosis, lung cancer

EMERGENCY AND FIRST AID PROCEDURES

Not available

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

N/A

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

N/A

INCOMPATIBILITY (MATERIALS TO AVOID)

N/A

HAZARDOUS DECOMPOSITION PRODUCTS

N/A

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Vacuum or wet clean only. No dry sweeping allowed.

WASTE DISPOSAL METHOD

In sealed plastic bag.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

Advise of Ind. Hygiene Dept.

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

None

MECHANICAL (GENERAL)

GLOVES

" "

None

SPECIAL

RESPIRATOR

" "

> 5 fiber/CC >5 μ long

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-314-0286
Amsco Diluent 125-82

MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME Amsco Division-Union Oil	EMERGENCY TELEPHONE NO.
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)	

TRADE NAME AND SYNONYMS Amsco odorless mineral spirits	CHEMICAL FAMILY Petroleum hydrocarbon family
CHEMICAL NAME AND SYNONYMS Amsco Diluent 125-82	FORMULA

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

BOILING POINT 360-400°F	° F.	VAPOR PRESSURE at 68°F	mm Hg.
MELTING POINT none available	° F.	VAPOR DENSITY (Air = 1) 5.17	
SPECIFIC GRAVITY (H ₂ O = 1) 0.74 - 0.77		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O negligible		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR clear, slight oily odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 129°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 6.0% LOWER 1.0%
METHOD USED closed cup		
EXTINGUISHING MEDIA		

water spray, CO₂, foam, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

none

UNUSUAL FIRE AND EXPLOSION HAZARDS

none

PRODUCT DESIGNATION
Amsco Diluent

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 200 PPM

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE Severe eye irritation, drying of skin; inhalation -
headache, dizziness, nausea.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES If swallowed - get medical aid; inhalation - artificial
respiration as necessary; wash eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

none

INCOMPATIBILITY (MATERIALS TO AVOID)

Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS Thermal decomposition may yield carbon monoxide.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Flush with water into retaining area or container. Avoid exposure to sparks,
fire or hot metal surface.

WASTE DISPOSAL METHOD

Incinerate under safe conditions.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

yes

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

goggles

MECHANICAL (GENERAL)

GLOVES

yes

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

Eye bath and safety shower.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep away from heat, sparks and open flame. Use with adequate ventilation.

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS - 000495487

PRODUCT DESIGNATION

03-213-9505

Azoxybenzene

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

Azoxybenzene $C_{12}H_{10}N_2O$

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.
			620		Rat	
				3000	Rabbit	

SECTION III PHYSICAL DATA

MW = 198.24

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

Decomposes

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

36°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.16

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

Insoluble

APPEARANCE AND ODOR

Pale yellow crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None available

FLAMMABLE
(EXPLOSIVE)

UPPER

METHOD USED

LIMITS

LOWER

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

On decomposition emits toxic fumes

PRODUCT DESIGNATION

Azoxybenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

Yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

Slight

RELEVANT SYMPTOMS OF EXPOSURE

Skin irritation, jaundice, cyanosis, dermatitis

EFFECTS OF CHRONIC EXPOSURE

Liver & kidney damage, malignant tumors

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

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

PRODUCT DESIGNATION

03-015-4607
Barium Metal

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 Barium		FORMULA Ba	

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			Not available			

SECTION III PHYSICAL DATA AW - 137.34

BOILING POINT 1140°C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 850°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 3.5		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O d		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Silver metal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA Carbon dioxide and dry chemical, dry graphite soda ash, powdered NaCl.

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Barium Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.5 mg/m³

CARCINOGENIC

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Nausea, vomiting, stomach pain, diarrhea, headache, weakness, paralysis of central nervous system - attack on eye and skin.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES If swallowed - wash mouth, drink glass of water with 2 tablespoons of epsom salt; inhalation - rest, keep warm; get medical attention; wash from eyes and skin with water.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

Water, 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

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber gloves

SPECIAL

RESPIRATOR

Self-contained breathing mask

OTHER PROTECTIVE EQUIPMENT

Rubber protective clothing, apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in tightly closed container under inert gas.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

Barium Chloride
03-015-1904

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 Barium Chloride	FORMULA $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$

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.
#1 Lowest published lethal dose oral - human 80 mg/kg.			150		Rat	
			See Note 1			

SECTION III PHYSICAL DATA MW - 244.28

BOILING POINT 35.7 ²⁰ ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -2H ₂ O 113 ⁰ C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 3.097 (24 ⁰ /4 ⁰)	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR
Colorless crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Barium Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.806 mg/m³ CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION Ingestion or inhalation of dust SKIN AND EYE IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE Dermatitis, conjunctivitis and bronchial irritation, arterial hypertension, muscle twitching.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give 2 tablespoons of epsom salts in water, then 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

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

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

MECHANICAL (GENERAL) GLOVES

SPECIAL Rubber RESPIRATOR W/proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-015-5538
Barium Nitrate

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 Barium Nitrate	FORMULA $\text{Ba}(\text{NO}_3)_2$

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.
			355		Rat	
				See Note		
#1 LD ₅₀ Intravenous - mouse 8.5 mg/kg.						

SECTION III PHYSICAL DATA MW - 261.37

BOILING POINT Decomposes	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 592°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 3.24 at 23°C.		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR
Lustrous white crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
Water

SPECIAL FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
In contact with easily oxidizable substances - may react rapidly enough to cause ignition, violent combustion, or explosion.

PRODUCT DESIGNATION

Barium Nitrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.925 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Ingestion or inhalation dust

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE Dermatitis, conjunctivitis and bronchial irritation, tightness of face and neck muscles, vomiting, diarrhea, weakness, difficulty in breathing, possible peicistalsis, arterial hypertension, muscle twitching and cardiac dysfunction.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES If necessary give artificial respiration - if ingested give 2 tablespoonfuls of magnesium sulfate in water then an emetic, rest and keep warm - obtain medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

In combination with Barium Dioxide, Magnesium and Zinc.

HAZARDOUS DECOMPOSITION PRODUCTS

Yields toxic gaseous oxides of nitrogen when involved in a fire.

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

Separate from combustible, organic or other readily oxidizable materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-216-3006
BenzalazineMATERIAL 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
Dibenzal hydrazine

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS
Benzalazine

FORMULA

 $(C_6H_5CH=N)_2$

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 - 208.25

BOILING POINT --	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 93°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellow crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Benzalazine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None established

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE Irritation of skin, eyes and mucous membranes;

gastroenteric disturbances, anemia

EFFECTS OF CHRONIC EXPOSURE Blood abnormalities & liver damage, loss of appetite.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - induce vomiting, 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

SPECIAL

Rubber
RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-216-6006
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 FAMILY

Naphthanthracene
CHEMICAL NAME AND SYNONYMS

FORMULA

1,2-Benzanthracene

C₁₈H₁₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Notes			
Notes: Lowest published toxic dose						
subcutaneous - mouse 2 mg/Kg.						
Oral - Mouse 4 mg/Kg/5 weeks						
Skin - Mouse 240 mg/Kg. /5 weeks						

SECTION III PHYSICAL DATA MW - 228.29

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
Sublimes			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
160°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
Insoluble			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
N/A		LOWER
METHOD USED		
EXTINGUISHING MEDIA		
Water, carbon dioxide, foam or dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		
Wear goggles and self contained breathing apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

1,2, Benzanthracene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

Yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Slight

RELEVANT SYMPTOMS OF EXPOSURE

Nausea, vomiting

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest; if swallowed - remove by gastric
lavage or emetic; 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

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

PRODUCT DESIGNATION

Beryllium Nitrate
03-017-6661

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

Beryllium Nitrate

FORMULA

 $\text{Be}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 LD50 intraperitoneal	- rat 501 mg/kg.		See Note 1			

SECTION III PHYSICAL DATA MW - 187.08

BOILING POINT decomp. 100-200°C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 60°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.557		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol, % Wt.
APPEARANCE AND ODOR White, yellowish crystals.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA N/A		

SPECIAL FIRE FIGHTING PROCEDURES

Wear protective clothing and self-contained respirator.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Beryllium Nitrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 0.002 mg/m³

CARCINOGENIC

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of fume or dust.

SKIN AND EYE

IRRITATION Moderate to severe

RELEVANT SYMPTOMS OF EXPOSURE

Acute pneumonitis, chest pain, bronchial spasms, fever.

EFFECTS OF CHRONIC EXPOSURE

Berylliosis, weight loss and marked dyspnea, variable fever and probable heart failure, eczematous dermatitis.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - give oxygen if necessary, rest. Obtain medical help.

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 Full Protection

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With ultra filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-217-6107 Benzoyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS Benzoyl Bromide	FORMULA C_6H_5COBr

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			Not available			

SECTION III PHYSICAL DATA		
BOILING POINT 218-19°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 5.5 - 7.5°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.57		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Decomposes		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 Use water spray sparingly, foam, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Benzoyl Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Irritates respiratory system; burns skin, eyes, mouth and digestive system.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; get medical aid; if swallowed - wash mouth, drink water, milk of magnesia; get medical aid; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

Reacts with oxidizing materials

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

Self contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-219-0708
Benzyl 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 FAMILY

CHEMICAL NAME AND SYNONYMS

 α Bromotoluene, Benzyl Bromide

FORMULA

 $C_6H_5CH_2Br$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			Not available			

SECTION III PHYSICAL DATA MW - 171.04

BOILING POINT 198°C	° F.	VAPOR PRESSURE — mm Hg.
MELTING POINT -4°C	° F.	VAPOR DENSITY (Air = 1) 5.8
SPECIFIC GRAVITY (H ₂ O = 1) 1.438		EVAPORATION RATE (— = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Slightly yellow liquid with pleasant odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Water spray, dry chemical, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Benzyl Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

high

RELEVANT SYMPTOMS OF EXPOSURE Irritation of eyes, nose and throat; severe burns
to digestive tract if swallowed.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES If inhaled - rest; if swallowed - wash mouth, 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

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

PRODUCT DESIGNATION

03-219-1708
03-219-1758
Benzyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS <u>α chlorotoluene, Benzyl Chloride</u>	FORMULA <u>C₆H₅CH₂Cl</u>

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 lowest published toxic concentration in air			1231		Rat	
inhalation - human 16 PPM			1624		Mouse	
#2 lowest published toxic dose subcutaneous - rat						
50 mg/Kg.						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
179°C		at 160°C	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-43°C		4.36	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.10			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE, AND ODOR			
Slight yellow liquid with pungent, aromatic, irritating odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
153°F		
METHOD USED		LOWER
		1.1%

EXTINGUISHING MEDIA

Water spray, dry chemical, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Benzyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 1 PPM, 5 mg/C.M.

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

high

RELEVANT SYMPTOMS OF EXPOSURE

Irritation of eyes, nose and throat; severe burns to digestive tract if swallowed.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

If inhaled - 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

May undergo exothermic condensation in presence of copper, aluminum, iron, zinc, magnesium, tin and various other metals, as catalysts.

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

MECHANICAL (GENERAL)

Goggles

GLOVES

SPECIAL

Rubber

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

Self contained breathing apparatus

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

See Bromobenzene

PRODUCT DESIGNATION

03-221-1100
A-BromoethylbenzeneMATERIAL 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 FAMILY

CHEMICAL NAME AND SYNONYMS

(1-Bromoethyl) benzene

FORMULA

 $\text{CH}_3\text{CHBrC}_6\text{H}_5$

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

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 (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless to pale yellow liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 205°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		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

TOXIC LEVEL

Not available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Yes

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

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

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

PRODUCT DESIGNATION

03-221-9100
2-Bromopyridine

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 Bromo-pyridine

FORMULA

 $\text{BrC}_5\text{H}_4\text{N}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 lowest published lethal dose intraperitoneal - mouse	31.3 mg/kg.		See note 1			

SECTION III PHYSICAL DATA

MW - 158.01

BOILING POINT

193°C

° F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

--

° F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

1.657

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

Slightly soluble

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Liquid with fish-like odor

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

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

PRINCIPLE 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

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

PRODUCT DESIGNATION

03-222-1201
M-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 FAMILY

CHEMICAL NAME AND SYNONYMS

3-Bromotoluene

FORMULA

CH₃C₆H₄Br

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 - 171.04

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
183.7			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-39.8			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.41			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			
Colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
M-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

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

PRODUCT DESIGNATION

03-222-1231
O-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 FAMILY
CHEMICAL NAME AND SYNONYMS 2-Bromotoluene	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{Br}$

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 - 171.04

BOILING POINT 181°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -28°C	° F.	VAPOR DENSITY (Air = 1) 5.9
SPECIFIC GRAVITY (H ₂ O = 1) 1.42		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 175°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
O-Bromotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION Severe

REVELANT 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
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SPECIAL	RESPIRATOR With proper filter
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OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

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 FAMILY
CHEMICAL NAME AND SYNONYMS P-Tolyl Bromide, P-Bromotoluene	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{Br}$

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	
BOILING POINT ° F. 185°C MELTING POINT ° F. 27°C SPECIFIC GRAVITY (H ₂ O = 1) 1.39 SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble	VAPOR PRESSURE mm Hg. VAPOR DENSITY (Air = 1) 5.9 EVAPORATION RATE (____ = 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
METHOD USED		LOWER
EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

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

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

PRODUCT DESIGNATION

03-221-2100
BromoformMATERIAL 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

Tribromomethane, Bromoform

FORMULA

Br₃CH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 lowest published lethal dose subcutaneous - rabbit	410 mg/kg.			1820	mouse	

SECTION III PHYSICAL DATA MW-252.77

BOILING POINT 149-150°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 8.3°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 2.9		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.1		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid, chloroform odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

Emits toxic fumes when heated

PRODUCT DESIGNATION

Bromoform

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

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

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Yes

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

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 breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-024-5204
Bromine

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 Bromine	FORMULA Br ₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Notes:			See	Notes		
#1 LD ₅₀ intraperitoneal - rat 85.2 mg/kg.						
lowest published lethal concentration in air						
inhalation - rabbit 180 PPM - 7 hours						

SECTION III PHYSICAL DATA MW 159.81

BOILING POINT 58.78° C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -7.2° C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.928		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Reddish-brown fuming liquid or vapor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Non-flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
Large amounts of water

SPECIAL FIRE FIGHTING PROCEDURES

Wear special protective clothing and gas mask.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Strong oxidizing materials.

PRODUCT DESIGNATION

Bromine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 0.1 ppm

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of vapor and gas

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Severe irritant to all parts of respiratory system, can produce pulmonary edema, irritation of eyes and ulceration of skin. Pneumonia.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES Remove from exposure - give artificial respiration if necessary - Body contact - irrigate thoroughly with water - if ingested, swallow large quantities of water - obtain medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Acetaldehyde, acetylene, acrylonitrile, aluminum, antimony, calcium Nitride, cesium, acetylene carbide, cesium monoxide, copper hydride, copper carbide, fluorine.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Hypo solution (sodium thiosulfate) or time water poured over small spills. Anhydrous Ammonia vapor releases a safe distance. Can be used to neutralize large quantities of bromine vapor.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Tight fitting goggles

MECHANICAL (GENERAL)

GLOVES

Neoprene rubber

SPECIAL

RESPIRATOR

w/appropriate filter

OTHER PROTECTIVE EQUIPMENT

Special protective clothing, rubber apron, full face-shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry area out of direct sunlight, away from combustible, organic or readily oxidizable materials.

OTHER PRECAUTIONS

Keep above 20° C.

SIGNATURE

DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-220-1803 α-Bromo-acetophenone</p>

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 Phenacyl Bromide, α -Bromo-acetophenone	FORMULA $\text{BrCH}_2\text{COC}_6\text{H}_5$

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 - 199.05
BOILING POINT 119°C	° F.	VAPOR PRESSURE at 140°C 12 mm Hg.
MELTING POINT 50°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.647		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White to greenish crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED Carbon dioxide, dry chemical		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

 α -bromo-acetophenone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION 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. 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

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

PRODUCT DESIGNATION

03-220-2309
Bromoacetyl 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 FAMILY

CHEMICAL NAME AND SYNONYMS

Bromoacetyl Bromide

FORMULA

 BrCH_2COBr

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-201.87

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
150°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
--			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
2.32			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Decomposes			
APPEARANCE AND ODOUR			
Fuming liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
Not available		LOWER
METHOD USED		

EXTINGUISHING MEDIA No not use water or foam, use carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS When heated to decomposition point gives off toxic HBr.

PRODUCT DESIGNATION

Bromoacetyl Bromide

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 & 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 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

PRODUCT DESIGNATION

03-220-2809
3 Bromo-4-Aminotoluene

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 Bromo P Toluidine

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2 Bromo-4 Methyl Aniline

FORMULA

 $\text{CH}_3\text{C}_6\text{H}_3\text{BrNH}_2$

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.
			1.9		Bird	

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
240			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
16-18			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.5			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			
Liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

When heated emits highly toxic fumes.

PRODUCT DESIGNATION

3-Bromo-4 Aminotoluene

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 - 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

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

PRODUCT DESIGNATION
03-220-3309
5-Bromo-2-Aminotoluene

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 _____
4 Bromo-2-toluidine
CHEMICAL NAME AND SYNONYMS _____ FORMULA _____
4 Bromo 2 Methyl Analine CC1=CC=C(C=C1)NBr

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

BOILING POINT _____ ° F. VAPOR PRESSURE _____ mm Hg.
240°C
MELTING POINT _____ ° F. VAPOR DENSITY (Air = 1) _____
58-59°C
SPECIFIC GRAVITY (H₂O = 1) _____ EVAPORATION RATE (_____ = 1) _____
SOLUBILITY IN WATER Pts/100 pts H₂O VOLATILE _____ % Vol. _____ % Wt.
APPEARANCE AND ODOR
Crystalline

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT _____ FLAMMABLE
N/A (EXPLOSIVE)
METHOD USED _____ LIMITS
UPPER
LOWER

EXTINGUISHING MEDIA
Carbon dioxide, dry chemical, foam or water spray

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protective clothing

UNUSUAL FIRE AND EXPLOSION HAZARDS
When heated emits highly toxic fumes.

PRODUCT DESIGNATION

5 Bromo-2-Aminotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Eyes

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 - 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

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

PRODUCT DESIGNATION 03-220-4859 Bromobenzene

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
<u>Bromobenzol</u>	
CHEMICAL NAME AND SYNONYMS	FORMULA
<u>Phenyl bromide</u>	<u>C₆H₅Br</u>

SECTION II HAZARDOUS INGREDIENTS 65					
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 - 157.02	
BOILING POINT <u>156.2°C</u>	VAPOR PRESSURE at 40°C <u>10</u> mm Hg.
MELTING POINT <u>-30.7°C</u>	VAPOR DENSITY (Air = 1) <u>5.41</u>
SPECIFIC GRAVITY (H ₂ O = 1) <u>1.497</u>	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O <u>Insoluble</u>	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR <u>Clear, colorless liquid, aromatic odor.</u>	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT <u>124°F</u>	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		

EXTINGUISHING MEDIA <u>Water, foam, carbon dioxide, dry chemical</u>
SPECIAL FIRE FIGHTING PROCEDURES <u>Wear goggles and self contained breathing apparatus.</u>

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Bromobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

Yes

REVELANT 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 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

Self contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

Similar to benzoyl chloride

PRODUCT DESIGNATION

03-220-5809
M-Bromobenzoyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS M-Bromobenzoyl Bromide	FORMULA $\text{BrC}_6\text{H}_4\text{COBr}$

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

BOILING POINT 124-126°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT N/A	° 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 Colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Use water spray sparingly, foam, carbon dioxide or dry chemical.		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

M-bromobenzoyl bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Irritation of respiratory system, burns skin, eyes,
mouth and digestive tract

EFFECTS OF CHRONIC EXPOSURE

--

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

Reacts with oxidizing materials

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

PRODUCT DESIGNATION

03-220-6809
Bromochloromethane

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

Methylene chlorobromide

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Bromochloromethane

FORMULA

ClCH₂Br

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note.			
Lowest published lethal dose in air inhalation - mouse 1500 PPM						

SECTION III PHYSICAL DATA

MW 129.4

BOILING POINT

68°C

° F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

-55°C

° F.

VAPOR DENSITY (Air = 1)

4.46

SPECIFIC GRAVITY (H₂O = 1)

1.99

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Colorless liquid, sweet chloroform like odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

None

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

May emit toxic fumes when heated.

PRODUCT DESIGNATION

Bromochloromethane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 200 PPM, 1050 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE

Inhalation - pulmonary edema; irritation of eyes or skin;
central nervous system depression

EFFECTS OF CHRONIC EXPOSURE

Liver and 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

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

PRODUCT DESIGNATION

03-220-7809
P-BromoDiethylaniline

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

P-Bromo diethylaniline

FORMULA

$$\text{BrC}_6\text{H}_4\text{N}(\text{C}_2\text{H}_5)_2$$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			Not available			

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
270 °C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
33 °C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			
Yellow crystal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
Probably above 200°F estimated		
METHOD USED		LOWER
EXTINGUISHING MEDIA	Alcohol foam, water spray, carbon dioxide, dry chemical	

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Bromodiethylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

yes

REVELANT 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 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

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

PRODUCT DESIGNATION

03-220-8309

P-Bromodimethylaniline

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

P-bromo, N,N'dimethylaniline

CHEMICAL NAME AND SYNONYMS

FORMULA

P-bromodimethylanilineBrC₆H₄N(CH₃)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

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
<u>264° C</u>			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
<u>55° C</u>			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
<u>Insoluble</u>			
APPEARANCE AND ODOR			

Crystalline

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	<u>Probably above 200° F estimated</u>	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED			LOWER

EXTINGUISHING MEDIA

Alcohol foam, water spray, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-bromodimethylaniline

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

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

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

Similar to xylene

PRODUCT DESIGNATION

03-220-8809
2 Bromo-1,4-dimethybenzene

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-Bromo-P-Xylene

FORMULA

 $\text{BrC}_6\text{H}_3(\text{CH}_3)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note			
Note:						
Lowest published toxic concentration in air						
inhalation - human 75 PPM 110 months						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
205°C at 755 mm			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
9-10°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.356			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
Flash point estimated 100-200°F		LOWER
METHOD USED		

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical
water spray may be used to reduce rate of burning

SPECIAL FIRE FIGHTING PROCEDURES

Wear self contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2 bromo-1,4-dimethyl benzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Irritation of respiratory tract, disturbance of vision, dizziness, nausea, collapse, coma; burning of skin or eyes.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, blood & liver damage

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, get medical aid; if swallowed - give saline cathartics and demulcents, 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 breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-220-9359
P-Bromodiphenyl

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 _____

P-Bromodiphenyl

BrC₆H₄CH₃

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-233.11

BOILING POINT 310.8°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 89.8-90.3°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

White crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 290°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Water, foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Bromodiphenyl

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

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

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

Similar to chlorodiphenyl

PRODUCT DESIGNATION

03-220-9309
O-BromodiphenylMATERIAL 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

O-bromodiphenyl

FORMULA

 $\text{BrC}_6\text{H}_4\text{C}_6\text{H}_5$

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-233.11

BOILING POINT 296-8°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT <-20°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water, foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

O-Bromodiphenyl

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

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

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

PRODUCT DESIGNATION

03-221-5100
P-Bromophenacyl 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 FAMILY

CHEMICAL NAME AND SYNONYMS

P-Bromophenacyl Bromide

FORMULA

BrC₆H₄COCH₂Br

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 - 277.96

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

110

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

Insoluble

APPEARANCE AND ODOR

Needle-like crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

N/A

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

N/A

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Bromophenacvl Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion

IRRITATION

Yes

RELEVANT SYMPTOMS OF EXPOSURE 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

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS - 000590921

PRODUCT DESIGNATION

B-Bromopropionic Acid
03-201-4454MATERIAL 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

3 Bromopropionic Acid

 $\text{BrCH}_2\text{CH}_2\text{COOH}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			See Note			
Lowest published lethal dose -						
intraperitoneal - mouse	500 mg/kg.					

SECTION III PHYSICAL DATA MW - 152.99

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
--		at 142°C.	45
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
63°C.			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
1.48			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
very soluble			
APPEARANCE AND ODOR			
white solid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
None available		LOWER
METHOD USED		

EXTINGUISHING MEDIA

Water, foam, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

B-Bromopropionic Acid

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

Severe eye or skin burns, irritation of respiratory and digestive systems.

EFFECTS OF CHRONIC EXPOSURE

--

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)

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

PRODUCT DESIGNATION

03-222-2781
Sec-Butyl AcetateMATERIAL 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

Sec - Butyl Acetate

 $\text{CH}_3\text{COOCH}(\text{CH}_2)_2\text{CH}_3$

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-116.16

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
113°C		at 25°C	24
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
--		4.0	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
0.87			
SOLUBILITY IN WATER 3 Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid, mild odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
88°F		LOWER
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

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;

inhalation - oxygen as needed; wash skin & eyes.

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

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

03-222-2701

PRODUCT DESIGNATION

03-222-2721

03-222-2751

03-222-2761

N-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

Butyl Acetate

FORMULA

 $\text{CH}_3\text{COOC}_4\text{H}_9$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			7056		mouse	
			See Note			
Note:						
Lowest published toxic concentration in air						
Inhalation - human 200 PPM						

SECTION III PHYSICAL DATA MW-116.16

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
126°C		at 25°C	15
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-74°C		4.0	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.88			
SOLUBILITY IN WATER 1 Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
72°F		7.6
METHOD USED		LOWER
		1.7

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
N-Butyl Acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV-150 PPM, 710 mg/C.M. CARCINOGENIC NO

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE
Inhalation, ingestion, skin 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; 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)

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

PRODUCT DESIGNATION 03-208-0962 See butyl alcohol
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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 Butanol 2	FORMULA $\text{CH}_3\text{CH}_2\text{CHOHCH}_3$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 intraperitoneal - mouse	LD50 771 mg/lg.		See note 1			

SECTION III PHYSICAL DATA	
BOILING POINT 99.5°C	VAPOR PRESSURE at 20°C 10 ^{mm} Hg.
MELTING POINT -115°C	VAPOR DENSITY (Air = 1) 2.55
SPECIFIC GRAVITY (H ₂ O = 1) 0.808	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 12.5	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 75 C.C.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 9.8
METHOD USED Alcohol foam, water spray, carbon dioxide, dry chemical		LOWER 1.7
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
May react with oxidizing materials

PRODUCT DESIGNATION

Sec. Butyl Alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 150 PPM, 450 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE Skin and eye irritation, loss of coordination,
prostration, coma

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES Wash skin & eyes; if swallowed - induce vomiting, 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
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

See butyl amine

PRODUCT DESIGNATION

03-222-3701
Sec ButylamineMATERIAL 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-aminobutane

FORMULA

 $(C_4H_9)CH_2CHNH_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			350		Rat	

SECTION III PHYSICAL DATA MW-73.14

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
66°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-104°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.72			
SOLUBILITY IN WATER 100 Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid ammonia-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE)	UPPER
15°F	LIMITS	LOWER
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

REVELANT 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

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 breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 033-222-9211 α-Butylene Bromide
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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 1,2 dibromobutane	FORMULA <chem>CH3CH2CHBrCH2Br</chem>

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	
BOILING POINT 166°C	VAPOR PRESSURE mm Hg.
MELTING POINT -65°C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.82	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellowish liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA Water, foam, carbon dioxide, dry chemical
--

SPECIAL FIRE FIGHTING PROCEDURES Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
α - 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

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

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 <u>Goggles</u>
MECHANICAL (GENERAL)	GLOVES <u>Rubber</u>
SPECIAL	RESPIRATOR <u>With organic vapor resistant canister</u>
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE	DATE
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PRODUCT DESIGNATION 03-222-9241 β-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 FAMILY
CHEMICAL NAME AND SYNONYMS 2,3 dibromobutane	FORMULA <chem>CH3CHBrCHBrCH3</chem>

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 - 215.94
BOILING POINT 158°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -34.5°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.78		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		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 Water, foam, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES Water may be ineffective		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

 β -butylene bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

Moderate

REVELANT 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

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

PRODUCT DESIGNATION 03-246-4308 N-Butyl Ether
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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
1,1'-Oxybisbutane	
CHEMICAL NAME AND SYNONYMS	FORMULA
Dibutyl Ether	$C_4H_{10}OC_4H_{10}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note:			
Note:						
Lowest published lethal concentration in air						
inhalation - rat - 4000 PPM - 4 hours						

SECTION III PHYSICAL DATA		MW 130.22
BOILING POINT	° F.	VAPOR PRESSURE
142°C		at 20°C
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
-95°C		4.48
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)
0.77		
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE
insoluble		% Vol.
APPEARANCE AND ODOR		% Wt.
clear liquid with etherial odor		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT	FLAMMABLE (EXPLOSIVE)	UPPER
77°F		7.6%
METHOD USED	LIMITS	LOWER
		1.5%
EXTINGUISHING MEDIA		
alcohol foam, carbon dioxide, dry chemical		
SPECIAL 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

CARCINOGENIC no

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

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

self-contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

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

more toxic than ethyl formate

PRODUCT DESIGNATION

03-223-0302
N-Butyl Formate

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

Butyl Methanoate

FORMULA

$C_4H_9OOCH_3$

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 - 101.12

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
106°		at 31.6°	40
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-90°		3.52	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
0.911			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
slightly			
APPEARANCE AND ODOR			
colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE)	UPPER
64°	LIMITS	8.0%
METHOD USED		LOWER
CC		1.7%

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

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

REVELANT 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

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

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-223-2332
N-Butyl Iodide

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

1-Iodobutane

FORMULA

CH3CH2CH2CH2I

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 - 184.03

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

131°C

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

-103°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.62

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

Insoluble

APPEARANCE AND ODOR

Colorless to light brown liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

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

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

<p align="center">PRODUCT DESIGNATION</p> <p>03-223-2352 Sec - Butyl Iodide</p>
--

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 Iodobutane	FORMULA $C_4H_9ICH_3$

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	
BOILING POINT 120°C ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -104 ° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.60	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H 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	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

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

PRODUCT DESIGNATION

03-026-4805 Granular
03-026-4865 Sticks
Cadmium (Metal)

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 Cadmium		FORMULA Cd	

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 Lowest published toxic concentration in air			See Note 1			
Inhalation - human 9 mg/C.M.						

SECTION III PHYSICAL DATA MW - 112.41

BOILING POINT 767±2° C.	° F.	VAPOR PRESSURE at 394° C.	1 mm Hg.
MELTING POINT 320.9° C.	° 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
Hexagonal crystals or silver-white malleable metal.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA None available		
SPECIAL FIRE FIGHTING PROCEDURES Use self-contained breathing apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

Cadmium

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 0.05 mg/m³

CARCINOGENIC Yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation or ingestion of dust or fume

SKIN AND EYE

IRRITATION

REVELANT SYMPTOMS OF EXPOSURE Inhalation causes a metallic taste in mouth, shortness of breath, chest pains, ingestion: nausea, vomiting, diarrhea, headache, muscle aches, salivation abdominal pain, shock, liver damage and renal failure.

EFFECTS OF CHRONIC EXPOSURE Inhalation - loss of sense of smell, cough, dyspnea, weight loss, anemia, irritability and yellowstained teeth. Probable liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES Remove from exposure; treat pulmonary edema, liver and kidney damage if any. Calcium edetate orally is effective for inhalation. Obtain medical treatment.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Ammonium Nitrate, Tellurium, Zinc

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 or safety glasses

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

Mechanical filter respirator

OTHER PROTECTIVE EQUIPMENT

Protective coveralls and face shield

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-028-3516
Calcium Fluoride

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
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ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
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CHEMICAL NAME AND SYNONYMS Calcium Fluoride	FORMULA CaF ₂
--	-----------------------------

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			Not available			

SECTION III PHYSICAL DATA

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT ° F.	VAPOR DENSITY (Air = 1)
1360° C.	
SPECIFIC GRAVITY (H ₂ O = 1) 3.18	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White crystals	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
N/A

SPECIAL FIRE FIGHTING PROCEDURES
N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS
N/A

PRODUCT DESIGNATION

Calcium Fluoride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - TWA - 2.5 mg/M³

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust, ingestion

SKIN AND EYE

IRRITATION Light

RELEVANT SYMPTOMS OF EXPOSURE Irritation of nasal passages, nausea, vomiting, diarrhea, abdominal pains, irritation of eyes and skin.

EFFECTS OF CHRONIC EXPOSURE

Pulmonary fibrosis, increase radiographic density of bones.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, keep warm, get medical attention; if swallowed - wash mouth, give emetic, get medical attention; wash from skin or eyes, get medical attention.

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

SPECIAL

RESPIRATOR

With appropriate filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-227-4504
Carbon Tetrabromide

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

Tetrabromomethane

FORMULA

C Br₄

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 Lowest Published lethaldose			See note 1			
oral - rat 1000 mg/kg.						

SECTION III PHYSICAL DATA MW - 331.67

BOILING POINT 190°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT α-48°C, β90°C	° F.	VAPOR DENSITY (Air = 1) 11.4
SPECIFIC GRAVITY (H ₂ O = 1) 3.42		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.024		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless solid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Nonflammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA --		

SPECIAL FIRE FIGHTING PROCEDURES

Self contained respirator if heated in a fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Carbon tetrabromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

0.1 PPM suggested

CARCINOGENIC

No

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

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

Self contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-227-5004
CatecholMATERIAL 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

Pyrocatechol

FORMULA

 $C_6H_4(OH)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			3890		Rat	

SECTION III PHYSICAL DATA MW - 110.11

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
246°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
105°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.34			
SOLUBILITY IN WATER 45 Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless crystal salt

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
261°F		LOWER
METHOD USED		
CC		

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

--

UNUSUAL FIRE AND EXPLOSION HAZARDS

--

PRODUCT DESIGNATION
Catechol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Skin, ingestion

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

CAS - 000630080

PRODUCT DESIGNATION

03-927-5550
Carbon monoxideMATERIAL 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

Carbon monoxide

CO

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note:		Rat	1807
					Mouse	5718
					Guinea	2444
					Pig	
Note:						
Lowest published toxic concentration in air.						
Inhalation - man 650 PPM/45 min.						
Lowest published lethal concentration in air						
inhalation - man 4000 PPM/30 minutes.						

SECTION III PHYSICAL DATA MW - 28.01

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
-191°C.			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-207°C.		1.0	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
--			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Yes			
APPEARANCE AND ODOR			
Colorless, odorless gas.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
--		74.2%
METHOD USED		LOWER
		12.5%

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical, water spray.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Carbon monoxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

50 PPM, 55 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation

SKIN AND EYE

IRRITATION

None

REVEALANT SYMPTOMS OF EXPOSURE

Loss of coordination ocular muscles, aching limbs, headache, nausea, vomiting, collapse, death.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

Remove from exposure - artificial respiration, administer oxygen with 5% CO₂ or hyperbaric oxygen.

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)

GLOVES

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS - 000076222

PRODUCT DESIGNATION

03-619-3032
Camphor GumMATERIAL 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

2 Camphanone

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Camphor

FORMULA

 $C_{10}H_{16}O$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Notes:			See Notes-			
(1) Intraperitoneal - rat LD ₅₀ 900 mg/kg						
(2) Lowest published toxic dose						
skin - mouse 84 mg/C.M.						

SECTION III PHYSICAL DATA

MW - 152.23

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
204°C.			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
177°C.		5.24	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.992			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR	White transparent crystalline mass, aromatic odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
150°F.		3.5%
METHOD USED		LOWER
C.C.		0.6%
EXTINGUISHING MEDIA	Foam, carbon dioxide, dry chemical	

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Camphor Gum

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 2 PPM, 12 mg/C.M.

CARCINOGENIC neoplastic

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Rigidity of jaw muscles, headache, convulsive seizures, coma.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - medical aid, gastric lavage, cathartics,
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

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

PRODUCT DESIGNATION

03-001-0721
03-001-0741
Chromic Acid

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 Chromium trioxide	FORMULA CrO ₃

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note #1			
#1 Lowest published toxic concentration in air - Inhalation - human 0.110 mg/C.M.						

SECTION III PHYSICAL DATA MW 100.01

BOILING POINT decomposed	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 196°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.7		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Dark, purple-red crystals.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Non-flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Water		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

Decomposing material will form hot viscous foam - caution against possibility of steam explosion.

PRODUCT DESIGNATION
Chromic Acid

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - TWA 0.1 mg/m³ CARCINOGENIC yes

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE
Inhalation of dust or mist. IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE
Respiratory irritation, conjunctivitis, blistering of skin.

EFFECTS OF CHRONIC EXPOSURE
Inhalation - remove from exposure; wash from skin and eyes - Obtain medical aid.

EMERGENCY AND FIRST AID PROCEDURES

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Alkali metals, organic matter, acetone, pyridine, benzene.

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 - face shield
MECHANICAL (GENERAL)	GLOVES
SPECIAL	RESPIRATOR w/appropriate filter
OTHER PROTECTIVE EQUIPMENT Rubber apron	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Separate from combustible, organic or other readily oxidizable materials.

OTHER PRECAUTIONS
Avoid storage on wooden floors.

SIGNATURE DATE

PRODUCT DESIGNATION

03-040-3400
Chromium Metal

**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 Chromium	FORMULA Cr

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note 1			
#1 Lowest published toxic dose						
Intraperitoneal - rat	504 mg/kg.					

SECTION III PHYSICAL DATA

BOILING POINT 2200° C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 1615° C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) N/A		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Silver metal powder.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA N/A		
SPECIAL FIRE FIGHTING PROCEDURES N/A		
UNUSUAL FIRE AND EXPLOSION HAZARDS N/A		

PRODUCT DESIGNATION
Chromium Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 1 mg/CM CARCINOGENIC Yes

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

REVELANT SYMPTOMS OF EXPOSURE
==

EFFECTS OF CHRONIC EXPOSURE
May produce tumors, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, keep warm, get medical aid; 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

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 glasses
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MECHANICAL (GENERAL)	GLOVES
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SPECIAL	RESPIRATOR With proper filter
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OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-040-4550
Chromic Nitrate

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 Chromic Nitrate	FORMULA $\text{Cr}(\text{NO}_3)_3 \cdot 9 \text{H}_2\text{O}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			3250		Rat	

SECTION III PHYSICAL DATA MW - 400.15

BOILING POINT d 100° C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 60° C.	° 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
Purple crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA
N/A

SPECIAL FIRE FIGHTING PROCEDURES
N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS
N/A

PRODUCT DESIGNATION

Chromic Nitrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 3.84 mg/m³

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE

Lesions of the skin and mucous membrane.

EFFECTS OF CHRONIC EXPOSURE

Possible hepatitis, jaundice and kidney lesions.

EMERGENCY AND FIRST AID PROCEDURES After ingestion; induce vomiting or give gastric lavage;
if inhaled - rest, keep warm, get medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

--

INCOMPATIBILITY (MATERIALS TO AVOID)

Avoid contact with strong reducing agents.

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

MECHANICAL (GENERAL)

Safety glasses
GLOVES

SPECIAL

RESPIRATOR

With appropriate filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION
03-040-5600
03-040-5650
Chromium Potassium Sulfate

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
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ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
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CHEMICAL NAME AND SYNONYMS	FORMULA
Chromium Potassium Sulfate	$\text{CrK}(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			Data not available			

SECTION III PHYSICAL DATA MW 499.13

BOILING POINT N/A	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT N/A	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.81		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR Dark violet-red crystals.
--

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA N/A

SPECIAL FIRE FIGHTING PROCEDURES N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS N/A

PRODUCT DESIGNATION
Chromium Potassium Sulfate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 4.78 mg/C.M. CARCINOGENIC No

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

RELEVANT SYMPTOMS OF EXPOSURE
--

EFFECTS OF CHRONIC EXPOSURE
Skin ulcers and dermatitis.

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

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Safety glasses
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MECHANICAL (GENERAL)	GLOVES
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SPECIAL	RESPIRATOR With proper filter
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OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE	DATE
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PRODUCT DESIGNATION

03-228-1100
 α -chloro-acetophenone

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

Phenacyl Chloride

FORMULA

 $\text{Cl CH}_2\text{COC}_6\text{H}_5$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
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						

SECTION III PHYSICAL DATA W - 154.6

BOILING POINT 237-247°C	° F.	VAPOR PRESSURE at 0°C	mm Hg.
MELTING POINT 56°C	° F.	VAPOR DENSITY (Air = 1) 5.2	0.012
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR

White crystals - fragrant non-persistent odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

N/A

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

May react with water or steam to produce toxic and corrosive fumes.

PRODUCT DESIGNATION

 α -chloro-acetophenone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

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

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

Severe

REVELANT 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

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

PRODUCT DESIGNATION

02-228-1605
Chloroacetyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS α -chloroacetyl chloride	FORMULA ClCH_2COCl

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Lowest published lethal dose inhalation - rat 1000 PPM			See note			

SECTION III PHYSICAL DATA MW - 112.95

BOILING POINT 106 °F.	VAPOR PRESSURE mm Hg.
MELTING POINT -23 °C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.50	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Water white or slightly yellow liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Do not use water or foam use carbon dioxide or dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition point gives off
toxic chloride fumes

PRODUCT DESIGNATION

Chloroacetyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

REVELANT 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 H Cl alcohol & 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

PRODUCT DESIGNATION

03-934-4000
03-934-4040
03-934-4080
Chlorine, liquid, compressed

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

Chlorine

FORMULA

Cl₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
					Rat	293
					Mouse	137
Notes:						
Lowest published toxic concentration in air -						
Inhalation - human 15 PPM				See Notes		
Lowest published lethal concentration in air						
Inhalation - human 430 PPM						

SECTION III PHYSICAL DATA MW - 70.91

BOILING POINT -35°C.	° F.	VAPOR PRESSURE at 28°C.	mm Hg.
			4800
MELTING POINT -101°C.	° F.	VAPOR DENSITY (Air = 1)	
		2.49	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.47 (liquid)			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Fungent, irritating, greenish-yellow gas

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
Not combustible		LOWER
METHOD USED		

EXTINGUISHING MEDIA

Apply water to keep surrounding or tanks cool. Do not apply directly to leaks.

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Chlorine, liquid, compressed

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 1 PPM, 3 mg/C.M. CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation SKIN AND EYE IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Skin and eye burns, upper respiratory tract irritation,
pulmonary edema.

EFFECTS OF CHRONIC EXPOSURE
--

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, get medical aid, wash from
hands and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
May support combustion of flammable 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
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE	DATE
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PRODUCT DESIGNATION

03-228-3635
O-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 FAMILY

CHEMICAL NAME AND SYNONYMS

2-chlorobenzaldehyde

FORMULA

Cl C₆H₄CHO

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See note 1			
#1 lowest published lethal dose intraperitoneal - 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 (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.29			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Very slightly soluble			
APPEARANCE AND ODOR			
White crystal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
Not available		LOWER
METHOD USED		

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

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

REVELANT SYMPTOMS OF EXPOSURE Eye irritation, headache, drowsiness, gastroentric 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)

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

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 FAMILY

CHEMICAL NAME AND SYNONYMS

P-chlorobenzaldehyde

FORMULA

Cl C₆H₄CHO

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 - 140.57

BOILING POINT

° F.

213°C

VAPOR PRESSURE

mm Hg.

MELTING POINT

° F.

48°C

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.12

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

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
P-chlorobenzaldehyde

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, skin, inhalation of dust

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

MECHANICAL (GENERAL)

Goggles
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

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 FAMILY
CHEMICAL NAME AND SYNONYMS 1,2 Chlorobenzyl Chloride	FORMULA $C_6H_4CH_2Cl$

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-161.08

BOILING POINT 219°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -30°C	° F.	VAPOR DENSITY (Air = 1)	5.55
SPECIFIC GRAVITY (H ₂ O = 1)	1.27	EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O	Insoluble	VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Clear liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Water spray, dry chemical, carbon dioxide		
SPECIAL FIRE FIGHTING PROCEDURES		

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

O-Chlorobenzyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION High

REVELANT 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

MECHANICAL (GENFRAI)

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

PRODUCT DESIGNATION

03-228-4105
ChlorobenzeneMATERIAL 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

Chlorobenzol

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Phenyl chloride

FORMULA

 C_6H_5Cl

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			2910		Rat	

SECTION III PHYSICAL DATA MW - 112.56

BOILING POINT	° F.	VAPOR PRESSURE	10 ^{mm} Hg.
131.7°C		at 22.2°C	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-55.6°C		3.88	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
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	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
85°F		7.1%
METHOD USED		LOWER
Closed Cup		1.3%

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.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Yes

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

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

Self contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

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 FAMILY
CHEMICAL NAME AND SYNONYMS 1,4 Chlorobenzoyl Chloride	FORMULA $\text{ClC}_6\text{H}_4\text{COCl}$

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-175.02

BOILING POINT 221°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 16°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.38		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
Decomposes		
APPEARANCE AND ODOR		

Colorless liquid - fumes

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

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 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 location.

OTHER PRECAUTIONS

SIGNATURE	DATE
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PRODUCT DESIGNATION

03-228-5635

O-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 FAMILY

CHEMICAL NAME AND SYNONYMS

1,2 chlorobenzoyl chloride

FORMULA

 $\text{Cl C}_6\text{H}_4\text{COCl}$

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 - 175.02

BOILING POINT 230	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -4°C	° 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.
Decomposes			
APPEARANCE AND ODOR			
Colorless liquid - fumes			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Full protective clothing

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

O-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 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

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

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in coll, dry, well-ventilated room.

OTHER PRECAUTIONS

SIGNATURE

DATE

03-228-6605
M-Chlorobromobenzene

MATERIAL SAFETY DATA SHEET

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
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ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

FORMULA

1,3 Chlorobromobenzene

ClC H Br
6 4

SECTION II HAZARDOUS INGREDIENTS

[illegible]

SECTION III PHYSICAL DATA MW 191.47

BOILING POINT 196°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -21°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.63			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
N/A		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

PRODUCT DESIGNATION

M 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 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

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

PRODUCT DESIGNATION

03-228-6665
4 Chlorobromobenzene

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, 4 Chlorobromobenzene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

P Chlorobromobenzene

FORMULA

 $\text{ClC}_6\text{H}_4\text{Br}$

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 - 191.47

BOILING POINT 196°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 67°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.58		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White crystal		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		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

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

REVELANT SYMPTOMS OF EXPOSURE Cyanosis, deep and rapid respiration, irregualr 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

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
Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-229-0266
P-Chloriodobenzene

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 4 Chloro Iodobenzene	FORMULA $\text{ClC}_6\text{H}_4\text{I}$

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 - 238.47

BOILING POINT 228 °F.	VAPOR PRESSURE mm Hg.
MELTING POINT 56 °C °F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.89	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White solid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		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		

PRODUCT DESIGNATION

P-Chloriodobenzene

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

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Polyvinyl 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

PRODUCT DESIGNATION

03-229-0236

O-Chloriodobenzene

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

 $\text{ClC}_6\text{H}_4\text{I}$

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

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.	
234				
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)		
0.7				
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)		
1.95				
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol.	% Wt.

APPEARANCE AND ODOR

Colorless oil

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
N/A		
METHOD USED		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

PRODUCT DESIGNATION

O-Chloriodobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None availableCARCINOGENIC No

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

PRODUCT DESIGNATION

03-229-0206
M-Chloriodobenzene

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

3 Chloriodobenzene

FORMULA

 $\text{ClC}_6\text{H}_5\text{I}$

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 - 238.47

BOILING POINT

230°C

° F.

VAPOR PRESSURE

at 114°C

mm Hg.

14

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Yellow liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

N/A

METHOD USED

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

PRODUCT DESIGNATION

M-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 & 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

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 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

PRODUCT DESIGNATION

03-229-3216
1 Chloro-1-Nitropropane

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 1,1 Chloronitropropane	FORMULA $C_3H_7ClNO_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			510		Mouse	
			50		Rabbit	

SECTION III PHYSICAL DATA MW - 123.54

BOILING POINT 140°C	° F.	VAPOR PRESSURE at 20°C	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	5.8
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER 0.8 g/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 144	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER
EXTINGUISHING MEDIA Alcohol foam, water, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

May explode when heated

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

REVELANT 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

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

PRODUCT DESIGNATION

03-229-6466
3-Chloro, 1,2 Propanediol

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 Chlorohydrin

FORMULA

 $\text{ClCH}_2\text{CHOHCH}_2\text{OH}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			150		Rat	
				5	Mouse	
			160		Mouse	

SECTION III PHYSICAL DATA MW 110.54

BOILING POINT 213°C decomposes	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.33		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

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

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

PRODUCT DESIGNATION

03-229-7716
β-Chloropropionyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS 3 Chloropropionyl chloride	FORMULA $\text{CH}_2\text{ClCH}_2\text{COCl}$

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 - 126.98

BOILING POINT 144°C	° F.	VAPOR PRESSURE at 44°C	mm Hg. 18
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.33		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

 β Chloropropionyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

Severe

REVELANT 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

INCOMPATIBILITY (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

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

PRODUCT DESIGNATION

03-229-9216
2 Chloropyridine

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 chloropyridine

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2- chloropyridine

FORMULA

 C_5H_4NCl

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			107		Mouse	
				64	Rabbit	

SECTION III PHYSICAL DATA

MW 113.55

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
<u>170°C</u>		<u>at 13°C</u>	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
<u>--</u>		<u>3.93</u>	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
<u>1.21</u>			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
<u>Soluble</u>			
APPEARANCE AND ODOR			
<u>Oil with fish-like odor.</u>			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
<u>N/A</u>		
METHOD USED		LOWER
EXTINGUISHING MEDIA		
<u>Alcohol foam, carbon dioxide, dry chemical.</u>		

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2 Chloropyridine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion, skin

IRRITATION

Severe

REVELANT SYMPTOMS OF EXPOSURE

Narcosis, hoadache, 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

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

Use in hood

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

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 FAMILY

CHEMICAL NAME AND SYNONYMS

4 Chlorotoluene

FORMULA

 $\text{CH}_3\text{C}_6\text{H}_4\text{Cl}$
3-6-4

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 - 126.58

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

162°C

at 44°C

10

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

7°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.07

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

N/A

 FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

METHOD USED

LOWER

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

CARCINOGENIC No

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

PRODUCT DESIGNATION

03-230-0337
O-ChlorotolueneMATERIAL 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 Chlorotoluene

FORMULA

 $\text{CH}_3\text{C}_6\text{H}_4\text{Cl}$

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 126.58

BOILING POINT 159°C	° F.	VAPOR PRESSURE at 43°C	mm Hg.
MELTING POINT -37°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.08		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR Colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

--

UNUSUAL FIRE AND EXPLOSION HAZARDS

--

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

REVELANT 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

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

PRODUCT DESIGNATION

03-230-0307
M-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 FAMILY

CHEMICAL NAME AND SYNONYMS

3 Chlorotoluene

FORMULA

CH3C6H4Cl

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 - 126.58

BOILING POINT

° F.

VAPOR PRESSURE

162°C

at 43°C

mm Hg.

10

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

-48°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.08

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

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

M-Chlorotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion

IRRITATION Severe

REVELANT 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

PRODUCT DESIGNATION

03-623-5020
Cleaning Mixture #49

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 Cleaning mixture #49	FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Stoddard solvent	70%	100 PPM				
Methylene chloride	30%	100 PPM	See Note 1 -			
Note 1: Lowest published toxic concentration in air						
Inhalation - human	500 PPM/1 Yr.					
Note 2: Lowest published toxic concentration in air			See Note 2			
Inhalation - human	230 PPM					

SECTION III PHYSICAL DATA

BOILING POINT Unknown	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) Unknown		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O --		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Volatile liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Water spray, carbon dioxide, dry chemical.		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
Cleaning mixture #49

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 100 PPM

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion, skin

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE

Headache, giddiness, stupor, irritability, fatigue, eye
and respiratory passage irritation.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid; inhalation -
artificial respiration 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

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

PRODUCT DESIGNATION 03-042-4001 Cobalt Metal

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 Cobalt	FORMULA Co

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note 1.			
#1 lowest published lethal dose						
oral - rat 1500 mg/kg.						

SECTION III PHYSICAL DATA		MW 58.93
BOILING POINT 2900° C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 1495° C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 8.9 20°/4° C.		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Silver-gray metal		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA N/A		
SPECIAL FIRE FIGHTING PROCEDURES N/A		
UNUSUAL FIRE AND EXPLOSION HAZARDS N/A		

PRODUCT DESIGNATION

Cobalt Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 0.1 mg/m³

CARCINOGENIC

Neoplastic
Effects

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust

SKIN AND EYE

IRRITATION mild

RELEVANT SYMPTOMS OF EXPOSURE Inhalation - shortness of breath, lung densities, dermatitis with hyperemia and vesiculation. Ingestion - hypotension, pain, vomiting, nerve deafness,

EFFECTS OF CHRONIC EXPOSURE

Possible pneumoconiosis

EMERGENCY AND FIRST AID PROCEDURES Remove from exposure, rest. Keep warm - eye contact - wash with water. Obtain medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

In the powdered state of cobalt - avoid ammonium nitrate, acetylene.

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

W/appropriate filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

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 O Hydroxy Toluene	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS O Methyl Phenol	FORMULA <chem>CH3C6H4OH</chem>

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES CONC.
			121		Rat
				1380	Rabbit

SECTION III PHYSICAL DATA		MW 108.13
BOILING POINT 191°C	° F.	VAPOR PRESSURE at 25°C 0.25 mm Hg.
MELTING POINT 31°C	° F.	VAPOR DENSITY (Air = 1) 3.72
SPECIFIC GRAVITY (H ₂ O = 1) 1.05		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 2.5		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR
Colorless liquid with sweet tarry odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 178	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER 1.35
METHOD USED C.C.		

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 No

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

Use water spray

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

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry, well-ventilated area

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-230-4807
Crotonaldehyde

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

B-Methylacrolein

CHEMICAL FAMILY

Aldehyde

CHEMICAL NAME AND SYNONYMS

2 Butenal

FORMULA

 $\text{CH}_3(\text{CH})_2\text{CHO}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀ mg/C.M.	
			ORAL	PERCUT.	SPECIES	CONC.
			300		Rat	
Note:					Rat	4000
Lowest published toxic concentration in air				30	Guinea pig	
inhalation - human 4.1 PPM						

SECTION III PHYSICAL DATA MW - 70.09

BOILING POINT 104°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -76°C	° F.	VAPOR DENSITY (Air = 1) 2.41
SPECIFIC GRAVITY (H ₂ O = 1) 0.85		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 18		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid, very irritating		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
55		15.5 %
METHOD USED		LOWER
O.C.		2.1%
EXTINGUISHING MEDIA		

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

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 gastrocntric 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

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

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

PRODUCT DESIGNATION

03-230-5307

Cumene

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

Iso-propylbenzene

FORMULA

 $(CH_3)_2CHCH_2CH_3$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1400		Rat	
#1 lowest published lethal concentration in air				See note		
inhalation - mouse 2000 PPM						

SECTION III PHYSICAL DATA MW - 120.19

BOILING POINT 152°C	° F.	VAPOR PRESSURE at 38.3°C	mm Hg.
MELTING POINT -96°C	° F.	VAPOR DENSITY (Air = 1)	10
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.862			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			
Colorless liquid, sharp aromatic odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 111°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 6.5
METHOD USED		LOWER 0.9
EXTINGUISHING MEDIA		

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Cumene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 50 PPM, 245 mg/Kg

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion, skin

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

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

PRODUCT DESIGNATION

03-046-2903
Cupric CarbonateMATERIAL 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

Cupric Carbonate

FORMULA

 $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$

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.
			159		Rat	

SECTION III PHYSICAL DATA MW - 221.17

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT d 200° C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 4.0		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR

Green powder

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

N/A

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

PRODUCT DESIGNATION
Cupric Carbonate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL		CARCINOGENIC	No
TLV 3.35 mg/C.M.			
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE		
Inhalation of dust (mainly), ingestion	IRRITATION	Moderate	
RELEVANT SYMPTOMS OF EXPOSURE	Irritation of eyes and mucous membranes, vomiting, diarrhea, abdominal pain, collapse.		
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)

With 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	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Safety glasses
MECHANICAL (GENERAL)	GLOVES
SPECIAL	RESPIRATOR
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION
03-230-7507
Cyclohexanone

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

Pimelic ketone

$\text{CO}(\text{CH}_2)_4\text{CH}_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED USHA STANDARD	LD ₅₀ <small>mg/Kg</small>		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1620		Rat	
				1000	Rabbit	
1 lowest published toxic concentration in air inhalation - human 50 PPM				See Note		
2 lowest published lethal concentration in air inhalation - rat 2000 PPM						

SECTION III PHYSICAL DATA

BOILING POINT 156°C	° F.	VAPOR PRESSURE 38.7°C	10 mm Hg.
MELTING POINT -45°C	° F.	VAPOR DENSITY (Air = 1) 3.4	
SPECIFIC GRAVITY (H ₂ O = 1) 0.95		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O slight		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR Colorless liquid - acetone-like odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 111°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Alcohol foam, dry chemical, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

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

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

PRODUCT DESIGNATION

03-230-7447
CyclohexanolMATERIAL 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

Cyclohexyl alcohol

FORMULA

 $C_6H_{11}OH$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			2060		Rat	
1, lowest published toxic concentration in air				See Note		
inhalation - human 100 PPM						

SECTION III PHYSICAL DATA MW - 100.16

BOILING POINT 161°C	° F.	VAPOR PRESSURE at 34°C	3.5 mm Hg.
MELTING POINT 25°C	° F.	VAPOR DENSITY (Air = 1)	3.46
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.96			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
3.6			
APPEARANCE AND ODOR			
Oily colorless liquid with odor like camphor and alcohol.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
154 ⁰ F		
METHOD USED		LOWER
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.

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION mild

REVELANT 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

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

PRODUCT DESIGNATION

03-230-7807
Cyclohexylamine

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 Aminocyclohexane	FORMULA $C_6H_{13}N$

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.
			710		Rat	
				320	Rabbit	

SECTION III PHYSICAL DATA MW-99.2

BOILING POINT 135°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -18°C	° F.	VAPOR DENSITY (Air = 1) 3.42
SPECIFIC GRAVITY (H ₂ O = 1) 0.87		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Colorless to yellow ammonia-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 90°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		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.

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

RESPIRATOR

Self-contained breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-234-0108
Decahydronapthalene

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 Decalin		FORMULA $C_{10}H_{18}$	

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
1 lowest published lethal concentration in air inhalation - rat - 1000 PPM			4170	See Note 1	Rat	

SECTION III PHYSICAL DATA MW - 138.25

BOILING POINT 193°C	° F.	VAPOR PRESSURE at 23°C	mm Hg.
MELTING POINT -43°C	° F.	VAPOR DENSITY (Air = 1) 4.8	
SPECIFIC GRAVITY (H ₂ O = 1) 0.9		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Water white liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 136°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 4.9 %
METHOD USED		LOWER .7 %

EXTINGUISHING MEDIA
Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Decahydronaphthalene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 25 PPM (suggested)

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Severe

REVELANT 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

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

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-208-1602
Diacetone AlcoholMATERIAL 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

4 hydroxy-4 methylpentanone 2

FORMULA

 $\text{CH}_3\text{COCH}_2(\text{CH}_3)_2\text{OH}$

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.
			4000		Rat	

SECTION III PHYSICAL DATA

BOILING POINT 328°F	° F.	VAPOR PRESSURE at 20°C	mm Hg. 1.1
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1) 4.0	
SPECIFIC GRAVITY (H ₂ O = 1) 0.9		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 00		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Liquid with faint pleasant odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 151°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 6.9%
METHOD USED		LOWER 1.8%

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Diacetone Alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 50 PPM, 240 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation (mainly), ingestion

SKIN AND EYE

IRRITATION Yes

RELEVANT SYMPTOMS OF EXPOSURE

Irritates eyes and mucous membranes, narcotic

EFFECTS OF CHRONIC EXPOSURE

Anemia, liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES

If inhaled - rest, give oxygen as needed; if swallowed - induce vomiting, 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

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety glasses

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

<p align="center">PRODUCT DESIGNATION</p> <p>03-234-4608 1,4-Diaminobutane Dihydrochloride</p>

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 $H_2N(CH_2)_4NH_2 \cdot 2HCl$

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	
BOILING POINT --	VAPOR PRESSURE mm Hg.
MELTING POINT >290°C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Very	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White crystal	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

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

TOXIC LEVEL

Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation, skin

SKIN AND EYE

IRRITATION

Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Nose, throat & eye irritation, headache, skin & eye burns,

~~depression of blood pressure, 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

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

PRODUCT DESIGNATION

03-234-7608
Di-N-Amylamine

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

Dipentylamine

FORMULA

(C₅H₁₁)₂NH

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.
			270		Rat	
			See note			
Note: Lowest published lethal concentration in air						
inhalation - rat 63 PPM / 4 hours						
Lowest published lethal dose 35 mg/kg						
skin - rabbit						

SECTION III PHYSICAL DATA MW - 157.26

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
202°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
		5.42	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.777			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Very slightly soluble			
APPEARANCE AND ODOR			
Water white liquid, ammonical odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
124°F		LOWER
METHOD USED		

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

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

Severe

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

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

PRODUCT DESIGNATION

03-234-8108
O-Dianisidine

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

3,3, Dimethoxybenzidine

FORMULA

 $(\text{NH}_2\text{C}_6\text{H}_3(\text{OCH}_3)_2)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note			
Lowest 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)	
138°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			
Colorless crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
not available		LOWER
METHOD USED		

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 no

PRINCIPLE 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

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

PRODUCT DESIGNATION

1,2,5,6 Dibenzanthracene
03-235-0709

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

Dibenz(a,h)anthracene

FORMULA

 $C_{22}H_{14}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note			
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 - 0.8 micrograms per kg.						

SECTION III PHYSICAL DATA

MW - 278.33

BOILING POINT sublimes	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 262°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Slightly soluble		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
1,2,5,6 - Dibenzanthracene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC yes

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, skin

SKIN AND EYE
IRRITATION moderate

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

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

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-235-4209
P-Dibromobenzene

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

4 dibromobenzene

FORMULA

Br₂C₆H₄

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 - 235.92

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
219°C		at 61°C	1
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
87°C		8.1	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
2.26			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			
Clear crystal, odor of xylene			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING 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-dibromobenzene

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 & 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)

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

Self contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-235-5209
4,4 - Dibromobiphenyl

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

P,P-Dibromobiphenyl

FORMULA

(Br C₆H₄)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 - 312.02

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

357°C

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

166°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.90

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

Insoluble

APPEARANCE AND ODOR

Crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

Water, foam, carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

4,4-Dibromobiphenyl

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

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

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-235-4709
4,6 - Dibromo-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	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 3,5 dibromo-2 hydroxytoluene	FORMULA $\text{Br}_2\text{CH}_2\text{C}_6\text{H}_2\text{OH}$

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 - 265.95

BOILING POINT decomposes at 265°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 56°	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O very slightly soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR crystal with phenolic odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		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
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
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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 FAMILY
CHEMICAL NAME AND SYNONYMS P,P-Dibromodiphenyl ether	FORMULA (BrC ₆ H ₄) ₂ O

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			See Note			
Lowest published lethal dose						
intraperitoneal - mouse 125 mg/kg.						

SECTION III PHYSICAL DATA MW-328.02

BOILING POINT 340°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 60°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O very soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR crystal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
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

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

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

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

PRODUCT DESIGNATION

03-263-0606

A,G - Dibromohydrin Glycerol

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

1,3 Dibromo 2 Propanol

 $\text{BrCH}_2\text{CHOHCH}_2\text{Br}$

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 - 217.91

BOILING POINT 219°C	° F.	VAPOR PRESSURE at 90°C	mm Hg.
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)	10
SPECIFIC GRAVITY (H ₂ O = 1) 2.12		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR yellow liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

A,G - Dibromohydrin Glycerol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

inhalation, ingestion, skin

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Severe gastrointestinal irritation, eye & nasal irritation,

nausea, vomiting, dizziness.

EFFECTS OF CHRONIC EXPOSURE

Nausea, vomiting, abdominal pain.

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

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

PRODUCT DESIGNATION

03-235-7209
2,6-Dibromo-4 Nitrophenol

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 O,O' Dibromo-P Nitrophenol	FORMULA $\text{Br}_2\text{C}_6\text{H}_3(\text{OH})\text{NO}_2$

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 - 296.92

BOILING POINT d > 145°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 143°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O very soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Water, dry chemical, carbon dioxide, alcohol foam		
SPECIAL FIRE FIGHTING PROCEDURES Wear self-contained gas mask		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

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

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

Rubber

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-235-8709
3,5 Dibromopyridine

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

3,5 Dibromopyridine

FORMULA

C₅H₃NBr₂

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 - 236.91

BOILING POINT

222°C

° F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

111°C

° F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

-

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

Slightly soluble

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Solid - fish-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

FLAMMABLE
(EXPLOSIVE)

UPPER

METHOD USED

LIMITS

LOWER

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

3,5 dibromopyridine

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

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

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

Use in hood

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

PRODUCT DESIGNATION

03-235-9209
2,5 - Dibromotoluene

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

2,5 - Dibromotoluene

FORMULA

BrC1=CC=C(C=C1)CBr

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 - 249.95

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

236⁰C

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

<-20⁰CSPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.81

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

Not available

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2,5 dibromotoluene

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 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

PRODUCT DESIGNATION

03-236-0400
N-dibutylamine

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

Di-N-butylamine

(C₄H₉)₂NH

SECTION II HAZARDOUS INGREDIENTS 4 9 2

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			550		Rat	
				1010	Rabbit	

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
159 ⁰ C		at 20 ⁰ C	2
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-62 ⁰ C		4.46	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.76			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
very soluble			
APPEARANCE AND ODOR			
liquid colorless			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
125 ⁰ F		
METHOD USED		LOWER
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

PRODUCT DESIGNATION

N Dibutylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

severe

REVELANT 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

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

PRODUCT DESIGNATION

03-208-2202
2 Di - N - Butylaminoethyl
Alcohol

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 Dibutylaminoethanol		FORMULA $[\text{CH}_3(\text{CH}_2)_3]_2\text{NCH}_2\text{CH}_2\text{OH}$	

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1070		Rat	
				1680	Rabbit	

SECTION III PHYSICAL DATA MW - 173.3

BOILING POINT 222°C	° F.	VAPOR PRESSURE 91-97°C	mm Hg.
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1) 6.0	
SPECIFIC GRAVITY (H ₂ O = 1) 0.85		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 200°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2 - Di - N - butylaminoethyl alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 2 PPM, 14 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Skin, ingestion, inhalation

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Dermatitis, weight loss, slight increase in clotting time

EFFECTS OF CHRONIC EXPOSURE

Dermatitis

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - drink fruit juice, 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

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

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 FAMILY
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 ⁰ C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1) 7.1
SPECIFIC GRAVITY (H ₂ O = 1) 0.94		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Light yellow liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 230 ⁰ F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Water, alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Di-N Butylaniline

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

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

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-236-4300
Di-N-Butyl Mercury

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 <u>di-butyl mercury</u>	FORMULA <u>Hg(C₄H₉)₂</u>

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note			
Lowest published lethal dose						
intraperitoneal - rat	8 mg/kg					

SECTION III PHYSICAL DATA MW - 314.83

BOILING POINT <u>123°C at 23 mm</u>	° F.	VAPOR PRESSURE <u>at 105°C</u>	mm Hg. <u>10</u>
MELTING POINT <u>--</u>	° F.	VAPOR DENSITY (Air = 1) <u>10.8</u>	
SPECIFIC GRAVITY (H ₂ O = 1) <u>1.80</u>		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O <u>Insoluble</u>		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR <u>Colorless liquid</u>			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT <u>not available</u>	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

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.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

ingestion, skin, inhalation

SKIN AND EYE

IRRITATION slight

RELEVANT SYMPTOMS OF EXPOSURE Severe gastroenteric distress; dermatitis, decolonization of nails, ulcerisation 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

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

PRODUCT DESIGNATION

03-236-5800
Dichloroacetyl 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 FAMILY

CHEMICAL NAME AND SYNONYMS

Dichloroethanoyl Chloride

FORMULA

CH2CHCOC1

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀ ppm	
			ORAL	PERCUT.	SPECIES	CONC.
			2460		Rat	
				650	Rat	2000
					Rabbit	

SECTION III PHYSICAL DATA MW 147.4

BOILING POINT 108°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1) 5.1	
SPECIFIC GRAVITY (H ₂ O = 1) 1.53		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O reacts with water		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Clear liquid, acrid odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 151°C	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Do not use water or foam, use carbon dioxide or dry chemical.

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

INCOMPATIBILITY (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

PRODUCT DESIGNATION

03-236-7300
2,4-Dichlorobenzaldehyde

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 $C_7H_4Cl_2O$

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

BOILING POINT --	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 71°C	° F.	VAPOR DENSITY (Air = 1) --
SPECIFIC GRAVITY (H ₂ O = 1) --		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White crystal		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Foam, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		

INITIAL FIRE AND EXPLOSION HAZARDS

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

PRODUCT DESIGNATION

03-236-7800
M-dichlorobenzeneMATERIAL 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-dichlorobenzene	FORMULA $C_6H_4Cl_2$

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

BOILING POINT 173°C	° F.	VAPOR PRESSURE at 12.1°C	1 mm Hg.
MELTING POINT 24.8°C	° F.	VAPOR DENSITY (Air = 1) 5.08	
SPECIFIC GRAVITY (H ₂ O = 1) 1.288		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR
Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
Water spray, foam, CO₂ or dry chemicalSPECIAL FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

M-dichlorobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Unknown

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION severe

REVELANT SYMPTOMS OF EXPOSURE Eye, skin and 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 attention; 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

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

PRODUCT DESIGNATION

03-237-6401
Dicyclohexylamine

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

Dicyclohexylamine

FORMULA

 $(C_6H_{11})_2NH_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			373	-	rat	
Note;						
Lowest published lethal dose						
oral - mouse 500 mg/kg.						

SECTION III PHYSICAL DATA MW - 181.31

BOILING POINT 255°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 20°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.93		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.16		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR			

Colorless liquid, fishy odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT >210°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER

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)

CARCINOGENIC

Yes

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion

IRRITATION

SevereRELEVANT 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

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

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 FAMILY

CHEMICAL NAME AND SYNONYMS

1,4 dichloro-2-nitrobenzene

FORMULA

$$\text{Cl}_2\text{C}_6\text{H}_3\text{NO}_2$$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1210		Rat	

SECTION III PHYSICAL DATA

BOILING POINT 266°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 55°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.67		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Colorless crystal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Self-contained breathing apparatus

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2,5 - Dichloronitrobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation of dust

SKIN AND EYE

IRRITATION

Severe

REVELANT 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

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

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 FAMILY

CHEMICAL NAME AND SYNONYMS

3,4 dichloronitrobenzene

FORMULA

 $\text{Cl}_2\text{C}_6\text{H}_3\text{NO}_2$

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 - 192.00

BOILING POINT 256°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 43°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.43		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Colorless crystal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE- (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Water spray, foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

1,2 - dichlor - 4 - nitrobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation of dust

SKIN AND EYE

IRRITATION

Severe

REVELANT 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

PRODUCT DESIGNATION

03-237-3401
2,4 Dichlorophenol

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 - Dichlorophenol	FORMULA Cl C H OH

SECTION II HAZARDOUS INGREDIENTS 2 6 3

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Lowest published toxic dose			580		Rat	
skin - mouse, 312 mg/kg. -carcinogen				1730	Rat	
			1625		Mouse	

SECTION III PHYSICAL DATA MW - 163.01

BOILING POINT 210°C	° F.	VAPOR PRESSURE at 53°C	mm Hg.
MELTING POINT 45°C	° 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.
1.38			
0.45			
APPEARANCE AND ODOR White crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 237°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical, water		

SPECIAL FIRE FIGHTING PROCEDURES

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

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

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

PRODUCT DESIGNATION

03-237-3901
2,5 - Dichlorophenylhydrazine

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 2,5 - Dichlorophenylhydrazine	FORMULA $C_{12}H_8Cl_2N_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Lowest published lethal dose			See Note			
Oral - rat 500 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 105°C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Slightly soluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellow needle-like crystal	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Alcohol foam		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2,5 - dichlorophenylhydrazine

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 & 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

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

PRODUCT DESIGNATION

03-237-8401
Diethylamine

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

 $(C_2H_5)_2NH$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀ PPM	
			ORAL	PERCUT.	SPECIES	CONC.
			649		mouse	
			540		rat	
					rat	4000
				820	rabbit	

SECTION III PHYSICAL DATA

MW - 73.14

BOILING POINT

° F.

555°C

VAPOR PRESSURE

at 38°C

400 mm Hg.

MELTING POINT

° F.

-38.9°C

VAPOR DENSITY (Air = 1)

2.53

SPECIFIC GRAVITY (H₂O = 1)

0.71

EVAPORATION RATE (____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

Very soluble

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Colorless liquid with ammonia-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

<0°F

FLAMMABLE
(EXPLOSIVE)

UPPER

10.1%

METHOD USED

LIMITS

LOWER

1.8%

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

REVELANT 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

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

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store inside standard flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-237-8501
Diethylamine 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 FAMILY
CHEMICAL NAME AND SYNONYMS Diethylamine Hydrochloride	FORMULA (C ₂ H ₅) ₂ NH ₂ Cl

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 - 109.60

BOILING POINT 330°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 229°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.05		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 232		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR White crystal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
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) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

Rubber
RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-208-2752
B-Di Ethylaminoethyl Alcohol

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 _____
2 diethylaminoethanol $(C_2H_5)_2NCH_2CH_2OH$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1300		Rat	
				1260	Rabbit	

SECTION III PHYSICAL DATA

BOILING POINT _____ ° F. VAPOR PRESSURE _____ mm Hg.
322°F at 20°C 1.4
MELTING POINT _____ ° F. VAPOR DENSITY (Air = 1)
-- 4.0
SPECIFIC GRAVITY (H₂O = 1) _____ EVAPORATION RATE (_____ = 1)
0.9
SOLUBILITY IN WATER Pts/100 pts H₂O VOLATILE % Vol. % Wt.
Yes
APPEARANCE AND ODOR
Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 140°C FLAMMABLE (EXPLOSIVE) LIMITS UPPER
METHOD USED LOWER

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

B-Di - N - ethyl aminoethyl alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 10 PPM, 50 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Skin, inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Dermatitis, weight loss, slight increase in clotting time

EFFECTS OF CHRONIC EXPOSURE

Dermatitis

EMERGENCY AND FIRST AID PROCEDURES

Wash from skin and eyes; if swallowed - drink fruit juice, 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

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

PRODUCT DESIGNATION

03-238-3102
Diethylaniline

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

diethylphenylamine

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

NN diethylaniline

FORMULA

C₆H₅N(C₂H₅)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 - 149.23

BOILING POINT

° F.

215.5°C

VAPOR PRESSURE

1 mm Hg.

at 49.7°C

MELTING POINT

° F.

-38°C

VAPOR DENSITY (Air = 1)

5.15

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

0.9351

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

1.44

APPEARANCE AND ODOR

Colorless to yellow liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

185°F

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

Alcohol foam, water spray, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

diethylaniline

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 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

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

OTHER PROTECTIVE EQUIPMENT

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-238-4702
Diethyl-O-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

CHEMICAL NAME AND SYNONYMS

N,N-Diethyl-O-Toluidine

FORMULA

$$(C_2H_5)_2NC_6H_4CH_3$$

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

BOILING POINT	° F.	VAPOR PRESSURE	10 mm Hg.
209°C		at 86°C	
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			
Dark colored liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
None available		
METHOD USED		LOWER

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

PRODUCT DESIGNATION

Diethyl-O-Toluidine

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 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% acetic acid to aid removal.

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

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

PRODUCT DESIGNATION

03-238-4802
Diethyl-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
CHEMICAL NAME AND SYNONYMS N,N-Diethyl-P-Toluidine	FORMULA (C ₂ H ₅) ₂ NC ₆ H ₄ CH ₃

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

BOILING POINT 229°C	° F.	VAPOR PRESSURE at 103°C	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	10
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.92			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Dark colored liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
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		

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

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

PRODUCT DESIGNATION

03-238-4602
Diethyl-M-ToluidineMATERIAL 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 N,N,-Diethyl-M-Toluidine	FORMULA (C ₂ H ₅) ₂ NC ₆ H ₄ CH ₃

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

BOILING POINT --	° F.	VAPOR PRESSURE 97°C at 7	mm Hg.
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 Dark colored liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

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

PRODUCT DESIGNATION

Diethyl-M-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

yes

REVELANT 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

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

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

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 FAMILY
CHEMICAL NAME AND SYNONYMS 4,4 Difluorobiphenyl	FORMULA (F C H) 6 4 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 - 190.18

BOILING POINT 255°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 95°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.04		EVAPORATION RATE (= 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR Crystal power, aromatic odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Water, foam, carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

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

PRODUCT DESIGNATION

03-241-2405
P-Diiodobenzene

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 4-Diiodobenzene	FORMULA $C_6H_4I_2$

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 - 329.93

BOILING POINT 285°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 130°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR crystalline			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
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

P-diiodobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

severe

REVELANT 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

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Polyvinyl alcohol

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

PRODUCT DESIGNATION

03-239-2703
Dimethylamine (anhydrous)

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

Dimethylamine

FORMULA

 $(CH_3)_2NH$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			698		Rat	

SECTION III PHYSICAL DATA MW - 45.08

BOILING POINT 7°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -92°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.68		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O very soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR			
Colorless liquid, fish-like odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT		FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
21 ⁰ F			14.4%
METHOD USED			LOWER
C.C.			2.8%
EXTINGUISHING MEDIA			
Dry chemical carbon dioxide or foam			

SPECIAL FIRE FIGHTING PROCEDURES

Stop flow of gas, wear full protective clothing

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Dimethylamine anhydrous

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

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

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

CAS:000108010

PRODUCT DESIGNATION

03-208-3102

B-Dimethylaminoethyl Alcohol

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

Dimethylaminoethanol

(CH₃)₂NCH₂CH₂OH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			2340		Rat	
				1370	Rabbit	

SECTION III PHYSICAL DATA MW - 89.16

BOILING POINT 272°F	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1) 3.1
SPECIFIC GRAVITY (H ₂ O = 1) 0.9		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Yes		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 105 O.C.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

B-Dimethylaminoethyl Alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Skin, inhalation, ingestion

SKIN AND EYE

IRRITATION

Severe

REVELANT SYMPTOMS OF EXPOSURE

Dermatitis, weight loss, slight increase in clotting time.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis

EMERGENCY AND FIRST AID PROCEDURES

Wash from skin and eyes; if swallowed - drink fruit juice, 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

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

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	CHEMICAL FAMILY
<u>dimethylphenylamine</u>	
CHEMICAL NAME AND SYNONYMS	FORMULA
<u>NN dimethylaniline</u>	<u>C₆H₅N(CH₃)₂</u>

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.
			1410	1770	Rat Rabbit	

SECTION III PHYSICAL DATA MW - 121.18

BOILING POINT 193.1°C	° F.	VAPOR PRESSURE at 29.5°C	mm Hg.
MELTING POINT 2.5°C	° F.	VAPOR DENSITY (Air = 1)	1
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.9557			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless to brown liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 145°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED CC		LOWER

EXTINGUISHING MEDIA

"Alcohol" foam, water spray, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

dimethylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5PPM; 25 mg/C.M.

CARCINOGENIC no

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

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 filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

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 FAMILY

CHEMICAL NAME AND SYNONYMS

7,12 - Dimethyl(a)Anthracene

FORMULA

 $(CH_3)_2C_{18}H_{10}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			see notes			
Notes:						
1. Lowest published toxic dose oral - rat 30 mg/kg.						
2. " " " " skin mouse 0.014 mg/kg/17W						
3. " " " " skin rabbit 35 mg/kg/10W1						
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 ° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Greenish yellow crystals	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

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

TOXIC LEVEL

None available

CARCINOGENIC

yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust, ingestion, skin

SKIN AND EYE

IRRITATION

yes

REVELANT 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

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

PRODUCT DESIGNATION

03-239-6203
Dimethylbenzylamine

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
N, N Dimethylbenzylamine	(CH ₃) ₂ NCH ₂ C ₆ H ₅

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 - 135.20

BOILING POINT 184°C	° F.	VAPOR PRESSURE at 55°C	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	8
SPECIFIC GRAVITY (H ₂ O = 1) 0.920		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Slightly soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
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

Dimethylbenzylamine

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, 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

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

PRODUCT DESIGNATION

03-239-6703
Dimethyldihydroresorcinol

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

5,5 Dimethyl - 1, 3 Cyclohexanedione

FORMULA

 $(CH_3)_2 C_6 H_6 O_2$

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 - 140.18

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.

MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
149°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.42			
APPEARANCE AND ODOR			
Yellow crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
None available		LOWER
METHOD USED		

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

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

PRODUCT DESIGNATION

03-239-2453
N,N - Dimethyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS Dimethylformamide	FORMULA (CH ₃) ₂ NCHO

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/C.M.		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			1500		Rat	
Lowest published toxic concentration in air						
Inhalation human 20 PPM			See Note			

SECTION III PHYSICAL DATA MW-73.1

BOILING POINT 153°C	° F.	VAPOR PRESSURE at 25°C	3.7 mm Hg.
MELTING POINT -61°C	° F.	VAPOR DENSITY (Air = 1)	2.51
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.94			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
yes			
APPEARANCE AND ODOR			
Colorless, mobile liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 136°F	FLAMMABLE (EXPLOSIVE)	UPPER 15.2%
METHOD USED	LIMITS	LOWER 2.5%

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

May react with oxidizing materials

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

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-239-6403
2,6 Dimethyl-4-Heptanone

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

Di-isobutyl, Ketone

 $(C_4H_9)_2CO$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀ PPM	
			ORAL	PERCUT.	SPECIES	CONC.
			1416		Mouse	
					Rat	2000/8h

SECTION III PHYSICAL DATA

MW = 142.09

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

168°C

at 15°C

2.4

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

-46°C

4.9

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (____ = 1)

0.81

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

Low

APPEARANCE AND ODOR

Oil

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

140°F

METHOD USED

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER
6.2%LOWER
0.8%

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

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

REVELANT 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

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

PRODUCT DESIGNATION

03-239-2803
Dimethylamine 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 FAMILY
CHEMICAL NAME AND SYNONYMS Dimethylamine Hydrochloride	FORMULA (CH ₃) ₂ NH HCl

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	ID ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See note			
Note: Lowest published toxic dose oral - mouse 140 mg/kg.						

SECTION III PHYSICAL DATA MW - 81.58

BOILING POINT -- °F.	VAPOR PRESSURE mm Hg.
MELTING POINT 171 °C °F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 369	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless crystal	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Foam, dry chemical, carbon dioxide		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

Dimethylamine Hydrochloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

no

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

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

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 FAMILY
CHEMICAL NAME AND SYNONYMS α chloro-2,4 dimethyl acetophenone	FORMULA $\text{ClCH}_2\text{COC}_2\text{H}_5(\text{CH}_3)_2$

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 - 182.65

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 62°C	° 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
Needle-like crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		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.

PRODUCT DESIGNATION

2,4, Dimethylphenacyl chloride

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

PRODUCT DESIGNATION

03-240-1404
2,4 - Dimethylpiperidine

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 _____
 α, γ - Lupetidine $\text{HNC}_5\text{H}_8(\text{CH}_3)_2$

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 - 113.20

BOILING POINT _____ ° F. VAPOR PRESSURE _____ mm Hg.
139°C
MELTING POINT _____ ° F. VAPOR DENSITY (Air = 1) _____
SPECIFIC GRAVITY (H₂O = 1) _____ EVAPORATION RATE (_____ = 1) _____
0.845
SOLUBILITY IN WATER Pts/100 pts H₂O _____ VOLATILE _____ % Vol. _____ % Wt.
APPEARANCE AND ODOR
Liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT _____ FLAMMABLE (EXPLOSIVE) LIMITS _____
None available
METHOD USED _____ UPPER
LOWER

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
MECHANICAL (GENERAL)	Goggles
SPECIAL	GLOVES
OTHER PROTECTIVE EQUIPMENT	Rubber
	RESPIRATOR
	Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-240-1804
Dimethyl-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 FAMILY

CHEMICAL NAME AND SYNONYMS

FORMULA

2 Methyl-2-Pentanol

 $(CH_3)_2COH(CH_2)_2CH_3$

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 - 102.18

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 Pts/100 pts H₂O

VOLATILE

% 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

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

Rubber
RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

CA - 000067685

PRODUCT DESIGNATION

03-240-3505
DimethylsulfoxideMATERIAL 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

Methylsulfoxide

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Dimethylsulfoxide

FORMULA

 $(CH_3)_2SO$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ g/kg		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			20		rat	

SECTION III PHYSICAL DATA MW = 78.14

BOILING POINT

° F.

decomposes at 100°C.

VAPOR PRESSURE

at 20°C.

0.37 mm Hg.

MELTING POINT

° F.

6°C.

VAPOR DENSITY. (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.10

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

very soluble

APPEARANCE AND ODOR

clear, water white, hygroscopic liquid.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

203°F.

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

28.5%

LOWER

2.6%

METHOD USED

open cup

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition point, emits toxic fumes.

PRODUCT DESIGNATION

Dimethylsulfoxide

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 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)

GLOVES

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

PRODUCT DESIGNATION

03-240-4304
Dimethyl-M-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
CHEMICAL NAME AND SYNONYMS N, N Dimethyl-M-aminotoluene	FORMULA (CH ₃) ₂ NC ₆ H ₄ CH ₃

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 - 135.20

BOILING POINT 186°C	° F.	VAPOR PRESSURE at 98°C	mm. Hg. 20
MELTING POINT -61°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.93		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
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 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 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
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-240-4404
Dimethyl-O-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
CHEMICAL NAME AND SYNONYMS N,N Dimethyl-O-Aminotoluene	FORMULA (CH ₃) ₂ NC ₆ H ₄ CH ₃

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

BOILING POINT 215°C	° F.	VAPOR PRESSURE at 70°C	MW - 135.20	mm Hg.
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 oil				

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
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-O-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 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

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

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

CHEMICAL NAME AND SYNONYMS

N,N-Dimethyl-P-Aminotoluene

FORMULA

 $(\text{CH}_3)_2\text{NC}_6\text{H}_4\text{CH}_3$

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

BOILING POINT 211°C	° F.	VAPOR PRESSURE at 72°C	mm Hg.
			5
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.94			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
insoluble			
APPEARANCE AND ODOR			
liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
not available		LOWER
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.

PRODUCT DESIGNATION

Dimethyl-P-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

moderate

REVELANT 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

RESPIRATOR

with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-240-4804
2,4, Dinitroaniline

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
2,4, Dinitroaniline	$(\text{NO}_2)_2\text{C}_6\text{H}_3\text{NH}_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			418		rat	
Lowest published lethal dose				see note		
intraperitoneal - rat 250 mg/kg						

SECTION III PHYSICAL DATA MW - 183.12

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
188°C		EVAPORATION RATE (_____ = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		VOLATILE	% Vol. % Wt.
1.62			
SOLUBILITY IN WATER Pts/100 pts H ₂ O			
Insoluble			
APPEARANCE AND ODOR			
Yellow crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
435°F		LOWER
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.		

PRODUCT DESIGNATION	
2,4 Dinitroaniline	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
None available	no
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE
Inhalation of dust, ingestion, skin	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	
SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE	
Store away from oxidizing materials and heat.	
OTHER PRECAUTIONS	
SIGNATURE	DATE

PRODUCT DESIGNATION

03-240-5304
2,4 - Dinitroanisole

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 Methoxy-2,4 Dinitrobenzene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2,4 - Dinitroanisole

FORMULA

 $(\text{NO}_2)_2\text{C}_6\text{H}_3\text{OCH}_3$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT:	SPECIES	CONC.
			See note			
Note:						
Lowest published lethal dose						
oral - rat 100 mg/kg						

SECTION III PHYSICAL DATA MW - 198.13

BOILING POINT Sublimes	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 95°C	° F.	VAPOR DENSITY (Air = 1) 6.83
SPECIFIC GRAVITY (H ₂ O = 1) 1.34		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless crystal		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		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

REVELANT SYMPTOMS OF EXPOSURE

Blood damage, cyanosis, dissincoe, headache, increasedpulse 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

INCOMPATABILITY (MATERIALS TO AVOID)

Keep away oxidizing materials (explosive) inorganicnitrates, 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

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

PRODUCT DESIGNATION

03-240-5804
M-DinitrobenzeneMATERIAL 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

 $C_6H_4(NO_2)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			42		bird	

SECTION III PHYSICAL DATA MW - 168.11

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
303°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
90°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.58			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.3			

APPEARANCE AND ODOR

Colorless to yellow crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
not available		LOWER
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.

PRODUCT DESIGNATION

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

SKIN AND EYE

IRRITATION

moderate

REVELANT 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

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

Store only in a permanent magazine. Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

3,5, Dinitrobenzoyl chloride
03-240-6304

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

3,5 - Dinitrobenzoyl chloride

FORMULA

 $(\text{NO}_2)_2\text{C}_6\text{H}_3\text{COCl}$

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 - 230.57

BOILING POINT

° F.

VAPOR PRESSURE

at 196°C

12 mm Hg.

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

69°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

decomposes

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

yellow green crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Not available

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

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.

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

severeREVELANT 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

INCOMPATABILITY (MATERIALS TO AVOID)

Keep from oxidizing materials (explosive) inorganic nitrates, chlorides or

HAZARDOUS DECOMPOSITION PRODUCTS

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

PRODUCT DESIGNATION

03-240-7304
4,6 - Dinitro-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	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 3,5, dinitro-2-hydroxytoluene	FORMULA (NO ₂) ₂ C ₆ H ₂ C ₆ H ₂ (CH ₃)OH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			30		rat	
				1750	hamster	
				200	rat	
			21		mouse	
Note:			See Note			
Lowest published toxic concentration in air						
inhalation - human 1 mg/C.M.						

SECTION III PHYSICAL DATA MW-198.13

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 86°C ° F.	VAPOR DENSITY (Air = 1) 6.82
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Very slightly soluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellow crystals	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
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.

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

INCOMPATIBILITY (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

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

PRODUCT DESIGNATION

03-240-7804
4,4 - Dinitrodiphenyl

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 4,4 - Dinitrodiphenyl	FORMULA $\text{NO}_2\text{C}_6\text{H}_4\text{C}_6\text{H}_4\text{NO}_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note			
Note:						
Lowest published toxic dose						
oral - rat 860 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	MW - 244.20	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)		
233°C		EVAPORATION RATE (_____ = 1)		
SPECIFIC GRAVITY (H ₂ O = 1)		VOLATILE	% Vol.	% Wt.
1.45				
SOLUBILITY IN WATER Pts/100 pts H ₂ O				
Insoluble				
APPEARANCE AND ODOR				
Needle-like crystals				

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
None available		
METHOD USED		LOWER
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

PRINCIPLE ROUTES OF ABSORPTION
inhalation (mainly) ingestion

SKIN AND EYE
IRRITATION moderate

REVELANT 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)	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

PRODUCT DESIGNATION

03-240-6804
2,4 - Dinitrobromobenzene

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
1 bromo-2,4, Dinitrobenzene	(NO.) C ₆ H ₃ Br

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 - 247.02

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT ° F.	VAPOR DENSITY (Air = 1)
74°C	
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 crystals	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
None available		
METHOD USED		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 - Dinitrobromobenzene

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

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 (MATERIALS TO AVOID)

Keep from oxidizing materials (explosive) inorganic nitrates, chlorates or

HAZARDOUS DECOMPOSITION PRODUCTS

ammonium nitrate.

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

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

PRODUCT DESIGNATION

03-240-7004
2,4 - Dinitrochlorobenzene

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

1 chloro 2,4, - dinitrobenzene

FORMULA

(NO₂)₂C₆H₃Cl

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			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)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.68			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			
Crystalline			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 382°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED CC		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

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

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

PRODUCT DESIGNATION

03-240-9804
2,4, - Dinitrophenetole

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
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ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)

TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
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CHEMICAL NAME AND SYNONYMS α dinitrophenetole	FORMULA (NO ₂) ₂ C ₆ H ₃ OC ₂ H ₅
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SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See note			
Note:						
Lowest published lethal dose						
Oral - rat 250 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT decomposes	° F.	VAPOR PRESSURE	mm Hg.	
MELTING POINT 86°C	° 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.
very slightly soluble				
APPEARANCE AND ODOR				
colorless crystal				

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
none available		LOWER
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

PRODUCT DESIGNATION

Dinitrophenetole

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available (skin)

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation of dust, ingestion, skin

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

INCOMPATIBILITY (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

PRODUCT DESIGNATION

03-241-0405
2,4 - dinitrophenol

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 dinitrophenol

FORMULA

(NO₂)₂ C₆H₃OH

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.
			30		rat	
				25	rat	
			13		bird	

SECTION III PHYSICAL DATA MW - 184.11

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
115°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.56			

APPEARANCE AND ODOR

Yellow crystals, bitter taste.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
None available		LOWER
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.

PRODUCT DESIGNATION
2,4 dinitrophenol

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 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)	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

PRODUCT DESIGNATION

03-241-0605
2,4 - Dinitrophenyl hydrazine

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 - Dinitrophenylhydrazine

FORMULA

 $(\text{NO}_2)_2\text{C}_6\text{H}_3\text{NHNH}_2$

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 - 198.14

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

194°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

insoluble

APPEARANCE AND ODOR

red crystalline powder

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 operation

UNUSUAL FIRE AND EXPLOSION HAZARDS

dangerous explosive

PRODUCT DESIGNATION

2,4 - Dinitrophenylhydrazine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available (skin)

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion, skin

IRRITATION

severe

REVEALANT 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

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

Keep away from heat and sources of ignition or acute fire hazard.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-241-0905
2,6 Dinitrothymol

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 1,3 dinitro-5 isopropyl -
4 hydroxy - 6 methylbenzene

FORMULA

 $(\text{NO}_2)_2 \text{C}_6\text{H}(\text{CH}_3)(\text{C}_3\text{H}_7)\text{OH}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See note			
Note:						
Lowest published lethal dose						
oral - rat 100 mg/kg						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
55°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
insoluble			
APPEARANCE AND ODOR			
prismatic crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
none available		LOWER
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

Explosion hazard

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
MECHANICAL (GENERAL)	Goggles
SPECIAL	GLOVES
OTHER PROTECTIVE EQUIPMENT	RESPIRATOR

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

PRODUCT DESIGNATION

03-241-1405
2,4 - Dinitrotoluene

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 - Dinitro - 1 methyl benzene

FORMULA

$\text{CH}_3\text{C}_6\text{H}_3(\text{NO}_2)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			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)

70°C

6.27

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.32

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

0.03

APPEARANCE AND ODOR

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.

CARCINOGENIC

no

PRINCIPLE 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

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep separate from strong oxidizing and reducing agents.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-241-4905
Diphenyl

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 FAMILY

CHEMICAL NAME AND SYNONYMS

Biphenyl

FORMULA

$$\begin{array}{c} \text{C}_6\text{H}_5 \\ | \\ \text{C}_6\text{H}_5 \end{array}$$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			2180		rat	
			2400		rabbit	
				2500	rabbit	

SECTION III PHYSICAL DATA MW - 154.2

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
255°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
69-70°C		5.31	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.991			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
No			
APPEARANCE AND ODOR			
White crystal, pleasant odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 5.1% LOWER 0.6%
235°F		
METHOD USED		
C.C.		
EXTINGUISHING MEDIA		

carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

water may cause frothing.

carbon dioxide or dry chemical

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Diphenyl

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.2 PPM, 1 mg/C.M.

CARCINOGENIC

no

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

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

PRODUCT DESIGNATION

03-241-6405
M-Diphenylbenzene

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 Terphenyl	FORMULA $C_6H_5C_6H_4C_6H_5$

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

BOILING POINT 363°C	° F.	VAPOR PRESSURE	MW - 230.29	mm Hg.
MELTING POINT 87°C	° F.	VAPOR DENSITY (Air = 1)	7.95	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)		
1.16				
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol.	% Wt.
insoluble				
APPEARANCE AND ODOR				
Crystals				

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 375°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER
EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES Water or foam may cause frothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION	
M Diphenylbenzene	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
1 PPM, 9 mg/C.M. (ceiling values)	no
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE
Inhalation, ingestion	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 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
MECHANICAL (GENERAL)	Goggles
	GLOVES
SPECIAL	Polyvinyl alcohol
	RESPIRATOR
OTHER PROTECTIVE EQUIPMENT	With proper filter
SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE	
OTHER PRECAUTIONS	
SIGNATURE	DATE

PRODUCT DESIGNATION

03-241-6505
O-Diphenyl benzene

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

O-Terphenyl

FORMULA

$$\begin{array}{ccccccc} C & H & C & H & C & H \\ 6 & 5 & 6 & 4 & 6 & 5 \end{array}$$

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 - 230.29

BOILING POINT 332°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 57°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.14			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Insoluble			
APPEARANCE AND ODOR			
Crystalline			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT		FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
325 ⁰ F			
METHOD USED			LOWER
O.C.			
EXTINGUISHING MEDIA			

water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

water or foam may cause frothing

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

O-Diphenyl benzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

1 PPM, 9 mg/C.M. (Ceiling values)

CARCINOGENIC

no

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

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

PRODUCT DESIGNATION

03-241-6605
P-Diphenylbenzene

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
P Terphenyl	$C_6H_5C_6H_4C_6H_5$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See note			
Note:						
Lowest published lethal dose						
Oral - rat 500 mg/kg.						

SECTION III PHYSICAL DATA MW - 230.29

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
376°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
213°C		7.95	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.24			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Soluble in hot water			
APPEARANCE AND ODOR			
crystalline			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
405°C		
METHOD USED		LOWER
O.C.		
EXTINGUISHING MEDIA		
Water, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		
Water or foam may cause frothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION	
P-Diphenylbenzene	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
1 PPM, 9 mg/C.M. (Ceiling Value)	no
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE
Inhalation, ingestion	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	
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

PRODUCT DESIGNATION

03-242-0606

As-Diphenylhydrazine 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 FAMILY

CHEMICAL NAME AND SYNONYMS

1,1-Diphenylhydrazine hydrochloride

FORMULA

(C₆H₅)₂NNH₂·HCl

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 - 220.70

BOILING POINT not available	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT not available	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR white to grey white crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

alcohol foam, water, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

As Diphenylhydrazine hydrochloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE 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

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

PRODUCT DESIGNATION 03-242-2606 1,4 - Diphenylsemicarbazide
--

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 1,4 - Diphenylsemicarbazide	FORMULA $C_6H_5NHNHCONHC_6H_5$

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 - 227.26
BOILING POINT ° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT ° F. 180°C	VAPOR DENSITY (Air = 1)	7.8
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O very slightly soluble	VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		

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

SKIN AND EYE

inhalation, ingestion, skin

IRRITATION

severe

REVELANT 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

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

PRODUCT DESIGNATION

03-244-0407
Epichlorohydrin

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

1-chloro-2,3-Epoxypropane

FORMULA

 C_3H_5OCl

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.
			90		rat	
			238		mouse	
				1300	rabbit	
			see note			
Note:						
Inhalation - mouse LC100	- 7414 PPM - 30 months					

SECTION III PHYSICAL DATA MW - 92.52

BOILING POINT 118 ⁰ C	⁰ F.	VAPOR PRESSURE at 17 ⁰ C	10 mm Hg.
MELTING POINT -58 ⁰ C	⁰ F.	VAPOR DENSITY (Air = 1) 3.29	
SPECIFIC GRAVITY (H ₂ O = 1) 1.18		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR

colorless, mobile liquid, irritating chloroform-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 105 ⁰ F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED Open cup		LOWER

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 - 5 PPM, 19 mg/C.M. (skin)

CARCINOGENIC

neoplastic

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation, skin

SKIN AND EYE

IRRITATION

severe

REVELANT 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

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

rubber

MECHANICAL (GENERAL)

GLOVES

rubber

SPECIAL

RESPIRATOR

with proper filter

OTHER PROTECTIVE EQUIPMENT

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

PRODUCT DESIGNATION

03-244-1707
EthanolamineMATERIAL 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 amino ethanol	FORMULA $\text{NH}_2\text{CH}_2\text{CH}_2\text{OH}$

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.
			2140		rat	

SECTION III PHYSICAL DATA MW - 61.08

BOILING POINT 171°C	° F.	VAPOR PRESSURE at 60°C	mm Hg.
MELTING POINT 11°C	° F.	VAPOR DENSITY (Air = 1)	6
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.02			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
very soluble			
APPEARANCE AND ODOR colorless oil, ammoniacal odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 185°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
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.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

ingestion, inhalation

SKIN AND EYE

IRRITATION

severe

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 guice, 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

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

PRODUCT DESIGNATION

03-249-1601
β - Ethoxyethyl 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 Cellosolve acetate	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 2 Ethoxyethyl Acetate	FORMULA $C_2H_5OC_2H_4OOCH_3$

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.
			1910		guinea pig	
Note:				see note		
lowest published lethal concentration in air						
inhalation - rat 1500 PPM						

SECTION III PHYSICAL DATA MW - 132.17

BOILING POINT 156°C	° F.	VAPOR PRESSURE at 20°C	mm Hg. 1.2
MELTING POINT -62°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		4.72	
0.97		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

colorless liquid, pleasant odor, bitter taste.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 120°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED COC		LOWER 1.7%

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

 β Ethoxyethyl acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 100 PPM, 540 mg/C.M. (skin)

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION slightly

REVELANT 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

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

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-249-6601
Ethylamine, anhydrous

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 monoethylamine		CHEMICAL FAMILY	
CHEMICAL NAME AND SYNONYMS aminoethane		FORMULA $C_2H_5NH_2$	

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.
				390	rabbit	
				See notes		
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 - 4508

BOILING POINT 16.6°C	° F.	VAPOR PRESSURE at 2°C	mm Hg.
MELTING POINT -80.6°C	° F.	VAPOR DENSITY (Air = 1)	400
SPECIFIC GRAVITY (H ₂ O = 1) 0.8		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Infinitely soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, strong ammonical odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT < 0	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 14.0 %
METHOD USED		LOWER 3.5 %

EXTINGUISHING MEDIA

alcohol foam, carbon dioxide, dry chemical.

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

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

PRODUCT DESIGNATION

03-249-6701
Ethylamine, 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 FAMILY

CHEMICAL NAME AND SYNONYMS

aminoethane hydrochloride

FORMULA

 $C_2H_5NH_2 \cdot HCl$

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

BOILING POINT 16.6°C	° F.	VAPOR PRESSURE at 2°C	400 mm Hg.
MELTING POINT -80.6°C	° F.	VAPOR DENSITY (Air = 1)	1.56
SPECIFIC GRAVITY (H ₂ O = 1) 0.8		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER ∞ Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

colorless liquid, strong ammonical odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT <0°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 14.0%
METHOD USED		LOWER 3.5%

EXTINGUISHING MEDIA

alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

water may be ineffective

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Ethylamine hydrochloride

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 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

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

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 $C_6H_5NHC_2H_5$

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	
BOILING POINT 204°C	VAPOR PRESSURE at 39°C
MELTING POINT -64°C	VAPOR DENSITY (Air = 1) 4.18
SPECIFIC GRAVITY (H ₂ O = 1) 0.96	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR clear, yellow brown oil	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 185°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER
EXTINGUISHING MEDIA Foam, carbon dioxide, dry chemical		
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

no

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

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

PRODUCT DESIGNATION

03-249-8601
Ethylbenzene

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

Phenyl Ethane

FORMULA

$$\begin{array}{c} \text{C}_6\text{H}_5 \\ | \\ \text{C}_2\text{H}_5 \end{array}$$

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.
			3500		rat	
			see note 1			
#1 lowest published toxic dose						
ocular - human 200 PPM						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	MW - 106.16	
136.2°C		at 26°C	10 mm Hg.	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)		
-95°C		3.66		
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)		
0.86				
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol.	% Wt.
no				
APPEARANCE AND ODOR				
colorless liquid with aromatic odor				

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
59°F		LOWER
METHOD USED		

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

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

REVELANT 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

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

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-250-0202 Ethylbenzylaniline

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 Ethylbenzylphenylamine	FORMULA $C_6H_5N(C_2H_5)CH_2C_6H_5$

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
			none	available	

SECTION III PHYSICAL DATA	
BOILING POINT 286°C	VAPOR PRESSURE mm Hg.
MELTING POINT	VAPOR DENSITY (Air = 1) 7.28
SPECIFIC GRAVITY (H ₂ O = 1) 1.03	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR clear colorless oil	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

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.

PRODUCT DESIGNATION

Ethylbenzylaniline

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 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

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

PRODUCT DESIGNATION

03-250-0902
Ethyl bromoacetate

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

Ethyl bromoethanoate

FORMULA

 $\text{BrCH}_2\text{COOC}_2\text{H}_5$

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 - 167.01

BOILING POINT 160°C	° F.	VAPOR PRESSURE at 58°C	15 mm Hg.
MELTING POINT -20°C	° F.	VAPOR DENSITY (Air = 1) 5.8	
SPECIFIC GRAVITY (H ₂ O = 1) 1.51		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR colorless to straw colored liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
none available		
METHOD USED		LOWER
EXTINGUISHING MEDIA		
water, alcohol foam, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Ethyl bromoacetate

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, 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

rubber

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-250-0702
Ethyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS Bromoethane	FORMULA C_2H_5Br

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀ PPM	
			ORAL	PERCUT.	SPECIES	CONC.
					guinea pig	2200

SECTION III PHYSICAL DATA MW - 108.98

BOILING POINT 38.4°C	° F.	VAPOR PRESSURE at 21°C	400 mm Hg.
MELTING POINT -119°C	° F.	VAPOR DENSITY (Air = 1) 3.76	
SPECIFIC GRAVITY (H ₂ O = 1) 1.45		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.91		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless, volatile liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT -	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 11.3
METHOD USED		LOWER 6.7

EXTINGUISHING MEDIA

water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Ethyl Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 200 PPM, 890 mg/C.M.

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE

Central nervous system depression, irritation of respiratory system.

EFFECTS 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

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 breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-250-2002
Ethyl - A 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 SYNONYMS Ethyl-2 Bromopropionate	FORMULA $\text{CH}_3\text{CHBrCOOC}_2\text{H}_5$

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 - 181.04

BOILING POINT 160-5°C	° F.	VAPOR PRESSURE at 55°C	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	10
SPECIFIC GRAVITY (H ₂ O = 1) 1.35		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA water, alcohol foam, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

Ethyl - A Bromopropionate

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, 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

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

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 SYNONYMS

Ethyl - 3 Bromopropionate

FORMULA

$\text{BrCH}_2\text{CH}_2\text{COOC}_2\text{H}_5$

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 - 181.04

BOILING POINT 112°C at 44 mm	° F.	VAPOR PRESSURE at 73°C	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	15
SPECIFIC GRAVITY (H ₂ O = 1) 1.41		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 none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

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

CARCINOGENIC

no

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

--

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

RESPIRATOR

with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-250-3502
Ethyl Chloroacetate

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

Ethyl Chloroethanoate

FORMULA

$\text{ClCH}_2\text{COOC}_2\text{H}_5$

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 - 122.53

BOILING POINT 144°C	° F.	VAPOR PRESSURE at 38°C	mm Hg. 10
MELTING POINT -27°C	° F.	VAPOR DENSITY (Air = 1) 4.3	
SPECIFIC GRAVITY (H ₂ O = 1) 1.16		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR colorless liquid, fruity odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 179°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

water may be used to blanket fire, alcohol foam, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

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

REMARKS AND 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

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

PRODUCT DESIGNATION

03-250-3702
Ethyl Chlorocarbonate

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 Ethyl chloroformate	FORMULA $\text{ClCOOC}_2\text{H}_5$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			see note			
Lowest published lethal dose						
intraperitoneal - mouse	15 mg/kg.					

SECTION III PHYSICAL DATA

BOILING POINT 93°C	° F.	VAPOR PRESSURE -	mm Hg.
MELTING POINT 61°C	° F.	VAPOR DENSITY (Air = 1) 3.7	
SPECIFIC GRAVITY (H ₂ O = 1) 1.14		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O decomposes		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 61°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER
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

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE

IRRITATION severe

REVELANT 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)

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

gloves

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-250-2702
Ethyl Carbonate

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 _____
Diethyl Carbonate $(C_2H_5)_2CO_3$

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 - 118.13

BOILING POINT 127°C ° F. VAPOR PRESSURE at 20°C 30 mm Hg.

MELTING POINT -43°C ° F. VAPOR DENSITY (Air = 1) 4.1

SPECIFIC GRAVITY (H₂O = 1) 0.98 EVAPORATION RATE (_____ = 1)

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

APPEARANCE AND ODOR colorless liquid, mild odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 77°F FLAMMABLE (EXPLOSIVE) LIMITS UPPER LOWER

METHOD USED open cup

EXTINGUISHING MEDIA carbon dioxide, dry chemical, water may be ineffective.

SPECIAL FIRE FIGHTING PROCEDURES _____

UNUSUAL FIRE AND EXPLOSION HAZARDS _____

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

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

03-251 3303
Ethylidene Bromide

MATERIAL SAFETY DATA SHEET

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

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

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

FORMULA

1,1 dibromoethane

$$\frac{\text{Br}}{2} \text{ HCCH}$$

SECTION II HAZARDOUS INGREDIENTS

[illegible]

SECTION III PHYSICAL DATA MW -187.88

BOILING POINT 109°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 2.06		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
not available		LOWER
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

no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion, skin

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

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

PRODUCT DESIGNATION

03-251-3503
Ethylidene ChlorideMATERIAL 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

1,1, Dichloroethane

 $\text{C}_2\text{H}_4\text{Cl}_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			725		rat	

SECTION III PHYSICAL DATA MW - 98.97

BOILING POINT 58°C	° F.	VAPOR PRESSURE at 25°C	mm Hg.
MELTING POINT -97°C	° F.	VAPOR DENSITY (Air = 1)	3.44
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.17			
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.5		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR
Colorless liquid, ethereal odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 22°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 11.4%
METHOD USED C.C.		LOWER 5.6%

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.

CARCINOGENIC

no

PRINCIPLE 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 - get medical aid; inhalation-
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

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

PRODUCT DESIGNATION

03-251-4303
Ethyl Iodide

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

monoiodoethane

FORMULA

 C_2H_5I

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 - 155.98

BOILING POINT 72.2°C	° F.	VAPOR PRESSURE at 25°C	mm Hg.
			137
MELTING POINT -108.5°C	° F.	VAPOR DENSITY (Air = 1)	
		5.4	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.92			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.4			
APPEARANCE AND ODOR			
Colorless liquid, ethereal odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
Not available		
METHOD USED		LOWER

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

--

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition points, emits toxic fumes of iodates.

PRODUCT DESIGNATION

Ethyl iodide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION slight

REVELANT 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

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

PRODUCT DESIGNATION

03-251-9303
Ethyl IsothiocyanateMATERIAL 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 Ethyl Thiocarbimide	FORMULA C ₂ H ₅ NCS

SECTION II HAZARDOUS INGREDIENTS 2.5

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 - 87.2

BOILING POINT 131°C	° F.	VAPOR PRESSURE at 23°C	mm Hg. 10
MELTING POINT -6°C	° F.	VAPOR DENSITY (Air = 1) 3.01	
SPECIFIC GRAVITY (H ₂ O = 1) 1.00		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

colorless liquid, pungent odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

wear full protective clothing, self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

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

REVELANT 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

INCOMPATIBILITY (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

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

PRODUCT DESIGNATION

03-250-6402
Ethylene Bromohydrin

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
2 Bromoethanol	BrC ₂ H ₄ OH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Lowest published lethal intraperitoneal - mouse	dose 80 mg/kg		see note			

SECTION III PHYSICAL DATA MW - 124.98

BOILING POINT 149-150°C (Dec)	° F.	VAPOR PRESSURE 50°C	mm Hg. 12
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.79		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
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

CARCINOGENIC

no

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

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

PRODUCT DESIGNATION

03-250-6702
Ethylene Chlorobromide

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 1 Bromo 2 chloroethane	FORMULA $\text{BrC}_2\text{H}_4\text{Cl}$

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.
			64		rat	

SECTION III PHYSICAL DATA

BOILING POINT 106°C	° F.	VAPOR PRESSURE at 30°C	mm Hg.
MELTING POINT -18°C	° F.	VAPOR DENSITY (Air = 1)	4.94
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.72			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol, % Wt.

APPEARANCE AND ODOR

colorless, volatile liquid, sweet chloroform-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Ethylene chlorobromide

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 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

PRODUCT DESIGNATION

03-250-6902
Ethylene chlorohydrin

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

 β chloroethyl alcohol

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2 chloro-ethanol

FORMULA

 $\text{CH}_2\text{ClCH}_2\text{OH}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			71	84	rat	
			81		mouse	385
				56	rabbit	
			110		guinea pig	
			See Note 1			
# 1 lowest published lethal dose skin - human 5000 mg/kg.						

SECTION III PHYSICAL DATA MW - 80.52

BOILING POINT 129 ⁰ C	° F.	VAPOR PRESSURE at 30.3 ⁰ C	mm Hg. 10
MELTING POINT -69 ⁰ C	° F.	VAPOR DENSITY (Air = 1) 2.78	
SPECIFIC GRAVITY (H ₂ O = 1) 1.21		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O very		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR

colorless liquid, faint ethereal odor

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 140 ⁰ F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 15.9
METHOD USED O.C.		LOWER 4.9

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

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

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 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

PRODUCT DESIGNATION

03-250-7202
Ethylene Diacetate

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 Ethylene Glycol Diacetate	FORMULA (CH ₂ OOCCH ₃) ₂

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.
			4790		guinea pig	

SECTION III PHYSICAL DATA

MW - 146.14

BOILING POINT 191°C	° F.	VAPOR PRESSURE at 38°C	mm Hg. 1
MELTING POINT -31°C	° F.	VAPOR DENSITY (Air = 1) 5.04	
SPECIFIC GRAVITY (H ₂ O = 1) 1.13		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR

colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 205°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		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

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

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)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-250-8402
Ethylene Glycol Diacetate

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

Ethylene Diacetate

FORMULA

 $(CH_3OOCCH_2)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			4940		guinea pig	

SECTION III PHYSICAL DATA

MW - 146.14

BOILING POINT

191°C

° F.

VAPOR PRESSURE

at 38°C

mm Hg.

MELTING POINT

-31°C

° 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

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

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

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

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

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

CHEMICAL FAMILY

1,2 Ethanediamine

CHEMICAL NAME AND SYNONYMS

FORMULA

Diaminoethane

 $H_2N(C_2H_4)_2NH_2$

SECTION II HAZARDOUS INGREDIENTS 2 2 4 2

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀ ppm	
			ORAL	PERCUT.	SPECIES	CONC.
			1160		rat	4000
				424	mouse	
				730	rabbit	
			470		guinea pig	
Note:						
Lowest published toxic concentration in air			see note			
inhalation - human 200 PPM						

SECTION III PHYSICAL DATA MW - 60.10

BOILING POINT 117°C	° F.	VAPOR PRESSURE at 20°C	mm Hg.
MELTING POINT 9°C	° F.	VAPOR DENSITY (Air = 1)	1.1
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.899			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
soluble			

APPEARANCE AND ODOR

colorless, hygroscopic liquid, ammonia-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 110°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER

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

SKIN AND EYE

Inhalation (mainly) ingestion

IRRITATION severe

REVELANT SYMPTOMS OF EXPOSURE Irritation respiratory system, allergenic 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

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

PRODUCT DESIGNATION

03-250-8202
Ethylene Glycol

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
1,2 Ethanediol	CH ₂ OHCH ₂ OH

SECTION II HAZARDOUS INGREDIENTS 2 2

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			6610		guinea pig	
Lowest published lethal dose						
Oral - human - 1500 mg/kg.						

SECTION III PHYSICAL DATA MW - 62.1

BOILING POINT 198°C	° F.	VAPOR PRESSURE at 20°C	mm Hg.
MELTING POINT -13°C	° F.	VAPOR DENSITY (Air = 1)	0.05
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
1.11			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
very soluble			
APPEARANCE AND ODOR			
colorless, sweet tasting liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 232°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED CC		LOWER
		3.2
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)

CARCINOGENIC

neoplastic

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

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

PRODUCT DESIGNATION 03-247-0909 03-247-0939 Ethylene Glycol, Monobutyl Ether
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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 Butyl Cellosolve	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 2 Butoxy ethanol	FORMULA $C_4H_9OCH_2CH_2OH$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀ PPM	
			ORAL	PERCUT.	SPECIES	CONC.
			1480		rat	
			320	500	rabbit	
			1200	230	guinea pig	
			1300		mouse	700
			See Note:			

SECTION III PHYSICAL DATA MW - 118.17		
BOILING POINT 171°C	° F.	VAPOR PRESSURE at 20°C 0.6 mm Hg.
MELTING POINT -40°C	° F.	VAPOR DENSITY (Air = 1) 4.07
SPECIFIC GRAVITY (H ₂ O = 1) 0.90		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 141°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED CC		LOWER
EXTINGUISHING MEDIA carbon dioxide, dry chemical, water		

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

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

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

PRODUCT DESIGNATION

03-247-1209
Ethylene Glycolmonoethyl 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

2 Ethoxyethanol

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Cellosolve

FORMULA

$C_2H_5OCH_2CH_2OH$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			3000		rat	
Note: Lowest published lethan concentration in air			4310		mouse	
inhalation - rat 4000 PPM - 4 hours			3100		rabbit	
inhalation - mouse 1820 PPM			1400		guinea pig	
			See Note:			

SECTION III PHYSICAL DATA MW - 90.12

BOILING POINT 135°C	° F.	VAPOR PRESSURE 20°C	3.8 mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	3.10
SPECIFIC GRAVITY (H ₂ O = 1) 0.94		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O very soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, practically odorless			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 106°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 15.7%
METHOD USED		LOWER 2.6%

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

REVELANT 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

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

PRODUCT DESIGNATION

03-247-1509
Ethylene glycol
monomethyl 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 2 methoxyethanol		CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Methyl cellosolve		FORMULA $\text{CH}_3\text{OCH}_2\text{CH}_2\text{OH}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note: Lowest published toxic concentration in air			2460	1340	rat	
	inhalation - human 25 PPM		950	890	rabbit	
	lowest published lethal dose				guinea pig	
	oral - human - 3570 mg/Kg.					
	lowest published lethal concentration in air					
	inhalation - rat 2000 PPM - 4 hours					

SECTION III PHYSICAL DATA MW - 76.09

BOILING POINT 125°C	° F.	VAPOR PRESSURE at 20°C	mm Hg. 6.2
MELTING POINT -87°C	° F.	VAPOR DENSITY (Air = 1) 2.62	
SPECIFIC GRAVITY (H ₂ O = 1) 0.97		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O very soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, mild agreeable odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 115°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER
EXTINGUISHING MEDIA Alcohol foam, dry chemical, carbon dioxide		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Ethylene Glycol Monomethyl Ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV-25 PPM, 80 mg/C.M. skin

CARCINOGENIC no

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

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

PRODUCT DESIGNATION

03-251-6903
Ethyl Orthosilicate

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 Tetraethyl-0-silicate	FORMULA (C ₂ H ₅) ₄ SiO ₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			see note			
Lowest published letal concentration in air						
inhalation - rat 100 PPM						

SECTION III PHYSICAL DATA MW - 208.30

BOILING POINT 166 ⁰ C	° F.	VAPOR PRESSURE at 20 ⁰ C	mm Hg.
MELTING POINT -83 ⁰ C	° F.	VAPOR DENSITY (Air = 1)	7.22
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.93			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
decomposes			
APPEARANCE AND ODOR colorless liquid, faint odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 125 ⁰ F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER
EXTINGUISHING MEDIA Carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Ethyl Orthosilicate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 100 PPM, 850 mg/C.M.

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

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

PRODUCT DESIGNATION

03-251-9523
Ethyl M-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
CHEMICAL NAME AND SYNONYMS Ethyl-M-Toluidine	FORMULA CH ₃ -C ₆ H ₄ -NH-C ₂ H ₅

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 - 135.20

BOILING POINT 221°C	° F.	VAPOR PRESSURE at 102°C	mm Hg. 10
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 insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
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

REVELANT 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 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 liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE DATE

PRODUCT DESIGNATION

03-251-9553
Ethyl-O-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
CHEMICAL NAME AND SYNONYMS Ethyl-O-Toluidine	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{NHC}_2\text{H}_5$

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 - 135.20

BOILING POINT 216°C	° F.	VAPOR PRESSURE at 85°C	mm Hg. 6
MELTING POINT <-15°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.95		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES wear full protective clothing		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

Ethyl-O-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

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

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

PRODUCT DESIGNATION

03-251-9573
Ethyl-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
CHEMICAL NAME AND SYNONYMS Ethyl-P-Toluidine	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{NHC}_2\text{H}_5$

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 - 135.20

BOILING POINT 217°C	° F.	VAPOR PRESSURE at 101°C	mm Hg. 10
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.94		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Ethyl-P-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

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

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)	
TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS	FORMULA
P-Fluorobromobenzene	FC H Br

SECTION II HAZARDOUS INGREDIENTS 6 4

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 - 175.01

BOILING POINT 155°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -8°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.60		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING 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

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

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

polyvinyl alcohol gloves

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-257-2505
M-Fluorochlorobenzene

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-Fluorochlorobenzene	FORMULA $\text{FC}_6\text{H}_4\text{Cl}$

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

BOILING POINT 125°C	° F.	VAPOR PRESSURE mm Hg.	MW - 130.55
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

colorless liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT not available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING 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

M-Fluorochlorobenzene

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 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

goggles

MECHANICAL (GENERAL)

GLOVES

polyvinyl alcohol gloves

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

<p align="center">PRODUCT DESIGNATION</p> <p>O-Fluorochlorobenzene 03-257-2545</p>

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
O-Fluorochlorobenzene	$\text{FC}_6\text{H}_4\text{Cl}$

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 -130.55	
BOILING POINT 136°C	VAPOR PRESSURE mm Hg.
MELTING POINT -43°C	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 liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT not available	FLAMMABLE (EXPLOSIVE); LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING 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

O-Fluorochlorobenzene

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 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

goggles

MECHANICAL (GENERAL)

GLOVES

polyvinyl alcohol gloves

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-257-3425
M-FluorotolueneMATERIAL 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-Fluoromethyl benzene

FORMULA

 $\text{CH}_3\text{C}_6\text{H}_4\text{F}$

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 - 110.13

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
116°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-111°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.997			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.
insoluble			
APPEARANCE AND ODOR			
colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
none available		LOWER
METHOD USED		

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

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

REVELANT 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

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

PRODUCT DESIGNATION 03-257-3455 O-Fluorotoluene
--

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 O-Fluoromethylbenzene	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{F}$

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 - 110.13	
BOILING POINT 114°C	VAPOR PRESSURE mm Hg.
MELTING POINT -80°C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.004	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical.		
SPECIAL FIRE FIGHTING PROCEDURES		

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
O-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

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

PRODUCT DESIGNATION

03-257-3485
P-FluorotolueneMATERIAL 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

P-Fluoromethyl benzene

FORMULA

CH3CH2F

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

BOILING POINT		° F.		VAPOR PRESSURE		mm Hg.	
117°C							
MELTING POINT		° F.		VAPOR DENSITY (Air = 1)			
--							
SPECIFIC GRAVITY (H ₂ O = 1)				EVAPORATION RATE (_____ = 1)			
1.001							
SOLUBILITY IN WATER Pts/100 pts H ₂ O				VOLATILE		% Vol.	
insoluble						% Wt.	
APPEARANCE AND ODOR							

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
none available		LOWER
METHOD USED		

EXTINGUISHING MEDIA

Dry chemical, carbon dioxide, alcohol foam.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
P-Fluorotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL none available CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE

inhaleation, ingestion IRRITATION severe

REVELANT 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
MECHANICAL (GENERAL)	GLOVES
	gloved
SPECIAL	RESPIRATOR
	with proper filter
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

03-257-5405
Fumaryl chloride

MATERIAL SAFETY DATA SHEET

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

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

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

FORMULA

Trans-Butenedioyl chloride

(CLOCCH)

SECTION II HAZARDOUS INGREDIENTS

[illegible]

SECTION III PHYSICAL DATA MW - 153

BOILING POINT

0 F

VAPOR PRESSURE

mm Hg.

160°C

MELTING POINT

 θ F

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (= 1)

1.408

SOLUBILITY IN WATER. Pts/100 pts H₂O

VOLATILE

No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7		No. 8		No. 9		No. 10		No. 11		No. 12		No. 13		No. 14		No. 15		No. 16		No. 17		No. 18		No. 19		No. 20		No. 21		No. 22		No. 23		No. 24		No. 25		No. 26		No. 27		No. 28		No. 29		No. 30		No. 31		No. 32		No. 33		No. 34		No. 35		No. 36		No. 37		No. 38		No. 39		No. 40		No. 41		No. 42		No. 43		No. 44		No. 45		No. 46		No. 47		No. 48		No. 49		No. 50		No. 51		No. 52		No. 53		No. 54		No. 55		No. 56		No. 57		No. 58		No. 59		No. 60		No. 61		No. 62		No. 63		No. 64		No. 65		No. 66		No. 67		No. 68		No. 69		No. 70		No. 71		No. 72		No. 73		No. 74		No. 75		No. 76		No. 77		No. 78		No. 79		No. 80		No. 81		No. 82		No. 83		No. 84		No. 85		No. 86		No. 87		No. 88		No. 89		No. 90		No. 91		No. 92		No. 93		No. 94		No. 95		No. 96		No. 97		No. 98		No. 99		No. 100	
No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7		No. 8		No. 9		No. 10		No. 11		No. 12		No. 13		No. 14		No. 15		No. 16		No. 17		No. 18		No. 19		No. 20		No. 21		No. 22		No. 23		No. 24		No. 25		No. 26		No. 27		No. 28		No. 29		No. 30		No. 31		No. 32		No. 33		No. 34		No. 35		No. 36		No. 37		No. 38		No. 39		No. 40		No. 41		No. 42		No. 43		No. 44		No. 45		No. 46		No. 47		No. 48		No. 49		No. 50		No. 51		No. 52		No. 53		No. 54		No. 55		No. 56		No. 57		No. 58		No. 59		No. 60		No. 61		No. 62		No. 63		No. 64		No. 65		No. 66		No. 67		No. 68		No. 69		No. 70		No. 71		No. 72		No. 73		No. 74		No. 75		No. 76		No. 77		No. 78		No. 79		No. 80		No. 81		No. 82		No. 83		No. 84		No. 85		No. 86		No. 87		No. 88		No. 89		No. 90		No. 91		No. 92		No. 93		No. 94		No. 95		No. 96		No. 97		No. 98		No. 99		No. 100	
No. 1		No. 2		No. 3		No. 4		No. 5		No. 6		No. 7		No. 8		No. 9		No. 10		No. 11		No. 12		No. 13		No. 14		No. 15		No. 16		No. 17		No. 18		No. 19		No. 20		No. 21		No. 22		No. 23		No. 24		No. 25		No. 26		No. 27		No. 28		No. 29		No. 30		No. 31		No. 32		No. 33		No. 34		No. 35		No. 36		No. 37		No. 38		No. 39		No. 40		No. 41		No. 42		No. 43		No. 44		No. 45		No. 46		No. 47		No. 48		No. 49		No. 50		No. 51		No. 52		No. 53		No. 54		No. 55		No. 56		No. 57		No. 58		No. 59		No. 60		No. 61		No. 62		No. 63		No. 64		No. 65		No. 66		No. 67		No. 68		No. 69		No. 70		No. 71		No. 72		No. 73		No. 74		No. 75		No. 76		No. 77		No. 78		No. 79		No. 80		No. 81		No. 82		No. 83		No. 84		No. 85		No. 86		No. 87		No. 88		No. 89		No. 90		No. 91		No. 92		No.															

% Wt.

decomposes in water

APPEARANCE AND ODOR

Clear, straw-colored liquid, pungent odor, fumes in moist air.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Unknown

METHOD USED

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical. Keep away from water.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

Reacts with water or steam to produce HCl.

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

REVELANT 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

INCOMPATABILITY (MATERIALS TO AVOID) Reacts violently with water, ethal alcohol, dimethyl sulfoxide.

HAZARDOUS DECOMPOSITION PRODUCTS

Evolves 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

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 FAMILY

CHEMICAL NAME AND SYNONYMS

Methanamide

FORMULA

HCONH₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note			
Note:						
Intramuscular - guinea pig						
LD50 2539 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	MW - 45.04	
211°C		at 130°C	mm Hg.	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	30	
2.6°C		EVAPORATION RATE (_____ = 1)		
SPECIFIC GRAVITY (H ₂ O = 1)		VOLATILE	% Vol.	% Wt.
1.13				
SOLUBILITY IN WATER Pts/100 pts H ₂ O				
very soluble				
APPEARANCE AND ODOR				
Colorless, hygroscopic, oily, liquid, odorless				

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
310°F		LOWER
METHOD USED		
(COC)		
EXTINGUISHING MEDIA		
Water, alcohol foam, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION:

Formamide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 20 PPM, 30 mg/kg.

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

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

PRODUCT DESIGNATION

03-257-4405
FormanilideMATERIAL 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

Phenylformamide

FORMULA

 C_6H_5NCHO

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

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.	
271°C		216	120	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)		
50°C				
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)		
1.15				
SOLUBILITY IN WATER . Pts/100 pts H ₂ O		VOLATILE	% Vol.	% Wt.
slightly soluble				
APPEARANCE AND ODOR				
crystals				

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
none available		
METHOD USED		LOWER

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Formanilide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL None available CARCINOGENIC no

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

REVELANT SYMPTOMS OF EXPOSURE Cyanosis, headache, dizziness, confusion, blood pressure fall, 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

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
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MECHANICAL (GENERAL)	GLOVES rubber
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SPECIAL	RESPIRATOR with proper filter
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OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

Fungicide
03-649-3001

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 Betz-F-16	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Fungicide	FORMULA

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Sodium Pentachlorophenate	20.2	0.5 mg/kg	227	72	Rat	
Sodium 2-4-5-Trichlorophenate	7.5	--				
Sodium salts of chlorophenols	3.5	--				
Dehydroabietyl ammonium phenoxide	2.0	--				
Inert Materials	66.8%					

SECTION III PHYSICAL DATA

BOILING POINT None available	° F.	VAPOR PRESSURE mm Hg.
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 Yes		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Fungicide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION
severe

REVELANT SYMPTOMS OF EXPOSURE
Eye and nose irritation, heart failure, respiratory problems, anesthesia, sweating, coma.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis.

EMERGENCY AND FIRST AID PROCEDURES
If swallowed - induce vomiting, get medical aid, gastric lavage, inhalation - rest; wash from skin and 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 Wear protective clothing.	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-257-5905
Furfural

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

2 Furfuraldehyde

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2 Furfuraldehyde

FORMULA

 C_5H_4OCHO

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.
			127		rat	
				See note		
Lowest published lethal concentration in air						
inhalation - rat - 153 PPM - 4 h.						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	MW - 96.1	mm Hg.
162°C				
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)		
-36.5°C		3.31		
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)		
1.16				
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol.	% Wt.

APPEARANCE AND ODOR

colorless to yellow liquid, almond-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
140°F		LOWER
METHOD USED		2.1%
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

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

PRODUCT DESIGNATION 03-208-5002 Furfuryl alcohol

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 Furfural Alcohol	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 2-Furyl carbinol	FORMULA C₅H₄OCH₂OH

SECTION II HAZARDOUS INGREDIENTS 4 3 2						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			275		Rat	

SECTION III PHYSICAL DATA			
BOILING POINT 171°C	° F.	VAPOR PRESSURE at 31.8°C	mm Hg. 1
MELTING POINT -31°C	° F.	VAPOR DENSITY (Air = 1) 3.4	
SPECIFIC GRAVITY (H ₂ O = 1) 1.1		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Yes		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR Clear colorless mobile liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 167° F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 16.3%
METHOD USED Open cup		LOWER 1.8%
EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Furfuryl Alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5 PPM, 20 mg/C.M.

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Skin, inhalation, ingestion

SKIN AND EYE

IRRITATION

severe

RELEVANT SYMPTOMS OF EXPOSURE Severe eye inflammation, central nervous system depressant, nausea, salivation, diarrhea, dizziness.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; give artificial respiration as needed;
if swallowed - induce vomiting, gastric lavage, medical aid, wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

May explode with cyanoacetic acid or formic 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

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

PRODUCT DESIGNATION 03-257-7905 Furoyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS	FORMULA
Furoyl chloride	C ₄ H ₇ OCOC1

SECTION II HAZARDOUS INGREDIENTS 4-3					
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 - 130.53	
BOILING POINT 176°C	VAPOR PRESSURE mm Hg.
MELTING POINT -2°C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O decomposes	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS reacts with water or steam.

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

PRODUCT DESIGNATION

03-267-2407
Hexachloroethane

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

Carbon Hexachloride

FORMULA

C₂Cl₆

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			See Note			
Lowest published lethal dose						
intravenous - dog 325 mg/kg						
subcutaneous - rabbit - 4000 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
186°C		at 33°C	1
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
2.09			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
insoluble			
APPEARANCE AND ODOR			
colorless crystals with camphor-like odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
none available		LOWER
METHOD USED		

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Hexachloroethane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 1 PPM, 10 mg/C.M. skin CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION Inhalation, ingestion SKIN AND EYE IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE Eyes, skin, mucous membrane and lung irritation;
narcotic in high concentrations.

EFFECTS OF CHRONIC EXPOSURE Liver injury

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)
Avoid alkalies and metals.

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 rubber apron	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE	DATE
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PRODUCT DESIGNATION 03-267-3207 03-267-3255 03-267-3257 Hexane

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 Normal hexane	FORMULA C_6H_{14}

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
			See note 1		
#1 lowest published toxic concentration in air					
inhalation - human	1400 PPM - CNS				

SECTION III PHYSICAL DATA	
BOILING POINT 69°C	VAPOR PRESSURE at 15.8°C
MELTING POINT -96°C	VAPOR DENSITY (Air = 1) 2.97
SPECIFIC GRAVITY (H ₂ O = 1) 0.660	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O none	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT -7°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 7.5%
METHOD USED		LOWER 1.1%
EXTINGUISHING MEDIA carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
Hexane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 100 PPM, 360 mg/C.M. CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION Inhalation, ingestion SKIN AND EYE IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE Dizziness, convulsions, coma, chemical pneumonia,
eye and skin irritation.

EFFECTS OF CHRONIC EXPOSURE Dermatitis.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, give oxygen as needed; 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 safety glasses
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
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PRODUCT DESIGNATION 03-267-1707 Heptoyl 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 FAMILY
CHEMICAL NAME AND SYNONYMS Heptoyl Chloride	FORMULA $\text{CH}_3(\text{CH}_2)_5\text{COCl}$

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 - 148.03
BOILING POINT 175°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 0.96		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O decomposes		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		

UNUSUAL FIRE AND EXPLOSION HAZARDS Reacts with steam or water to produce HCl.
--

PRODUCT DESIGNATION
Heptoyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL None available CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION inhalation, ingestion SKIN AND EYE IRRITATION severe

REVELANT SYMPTOMS OF EXPOSURE Irritation of eyes and respiratory system; severe attack on digestive tract; 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) Reacts 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
MECHANICAL (GENERAL)	Goggles
SPECIAL	GLOVES Rubber
OTHER PROTECTIVE EQUIPMENT rubber apron	RESPIRATOR With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS - 000111706

PRODUCT DESIGNATION

n-Heptyl Alcohol
03-208-5202MATERIAL 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

1 Heptanol

FORMULA

 $C_7H_{15}OH$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		I.C. ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			3.25		rat	
			1500		mouse	
			750		rabbit	

SECTION III PHYSICAL DATA

MW - 116.23

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
175		at 30°C.	1.5
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
34.6°C.		4.0	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (0.2/min/cm ₂)	
0.913			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
18			
APPEARANCE AND ODOR			
colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
154°F.		
METHOD USED		LOWER

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
n-Heptyl Alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

M.A.C. - 100 PPM

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Skin, ingestion, inhalation

SKIN AND EYE

IRRITATION yes

REVELANT SYMPTOMS OF EXPOSURE Twitching, narcosis, weakness, tremors, hypothermia,
convulsions, eye irritation.

EFFECTS OF CHRONIC EXPOSURE

Liver damage.

EMERGENCY AND FIRST AID PROCEDURES Wash from skin and eyes; if swallowed - induce vomiting,
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

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety glasses

MECHANICAL (GENERAL)

GLOVES
Rubber gloves

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-001-1113
Hydrobromic Acid

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 Hydrobromic Acid	FORMULA HBr

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀ PPM	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note		Rat	2858
					Mouse	814
Lowest published toxic concentration in air						
Inhalation - human 5 PPM						

SECTION III PHYSICAL DATA MW - 80.92

BOILING POINT -67°C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -88.5°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 2.77		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR
Pale yellow liquid.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
Add water, then neutralize with chemically basic substances such as sodium bicarbonate, soda ash, or slaked lime.

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS In contact with common metals and presence of moisture produces hydrogen which may form explosive mixtures in air.

PRODUCT DESIGNATION

Hydrobromic Acid

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 3 PPM, 10 mg/C.M.

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of vapor, ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Conjunctivitis, pulmonary edema, coughing, choking, headache, dizziness, cyanosis.

EFFECTS OF CHRONIC EXPOSURE Possible jaw necrosis, erosion of teeth, bronchial irritation with chronic cough.

EMERGENCY AND FIRST AID PROCEDURES If ingested - give milk of magnesia, get medical aid, Inhalation - resuscitation measures if necessary. Wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Fluorine

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

Neoprene rubber

SPECIAL

RESPIRATOR
With appropriate filter

OTHER PROTECTIVE EQUIPMENT

Rubber apron, full face shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, well-ventilated place, separated from all oxidizing material.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-001-1324
Hydrogen 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 FAMILY
CHEMICAL NAME AND SYNONYMS Hydrochloric Acid	FORMULA HCl

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀ PPM	
			ORAL	PERCUT.	SPECIES	CONC.
#1 lowest published lethal concentration in air					Rat	4701
inhalation - rat 1000 mg/C.M.					Mouse	2142

SECTION III PHYSICAL DATA MW - 36.46

BOILING POINT -84.9° C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -114.8° C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.187		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Use water, neutralize with chemically basic substances.		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS On contact with common metals produces hydrogen which may form explosive mixtures in air.		

PRODUCT DESIGNATION

Hydrochloric Acid

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 5 ppm, 7 mg/C.M. ceiling value

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of vapor or mist.

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Conjunctivitis, pulmonary edema, choking, coughing, headache, dizziness, cyanosis, low blood pressure and high pulse pressure. Severe ulceration of skin.

EFFECTS OF CHRONIC EXPOSURE

Possible jaw necrosis, erosion of teeth, bronchial irritation with chronic cough.

EMERGENCY AND FIRST AID PROCEDURES Ingestion: dilute with large quantities of water or milk.

Then use milk of magnesia. Eye or skin contact: flood areas with large amounts of water for 15 min. Inhalation: remove from exposure - use artificial respiration if necessary.

SECTION VI REACTIVITY DATA

Obtain medical help.

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Calcium Carbide, Cesium Acetylene Carbide, Cesium Carbide, Dural 100, Lithium Silicide, Magnesium Boride, Rubidium Acetylene Carbide.

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

Neoprene Rubber

SPECIAL

RESPIRATOR

w/appropriate filter

OTHER PROTECTIVE EQUIPMENT

Rubber apron, full face shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, well-ventilated place, separated from all oxidizing materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-001-0922
Hydriodic Acid

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 Hydriotic Acid	FORMULA HI

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			Not	available		

SECTION III PHYSICAL DATA MW - 127.91

BOILING POINT -35.38°C at m	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -50.8°C.	° F.	VAPOR DENSITY (Air = 1)	4.4
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
2.85			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Pale yellow liquid.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Use water, neutralize with chemically basic substances.		

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Hydriodic Acid

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Suggest value 10 PPM

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of vapor

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Conjunctivitis, pulmonary edema, coughing, choking, headache,
~~disinoccc, cyanosis.~~EFFECTS OF CHRONIC EXPOSURE Possible jaw necrosis, erosion of teeth, bronchial irritation
with chronic cough.EMERGENCY AND FIRST AID PROCEDURES Ingestion - give milk of magnesia; get medical aid;
inhalation - respiratory resuscitation as needed, wash skin & eyes - get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Fluorine, Perchloric 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

Neoprene rubber

SPECIAL

RESPIRATOR

W/appropriate filter

OTHER PROTECTIVE EQUIPMENT

Rubber apron, full face shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Avoid physical damage.

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS - 007664393

PRODUCT DESIGNATION

Hydrogen Fluoride
 03-950-8135 03-950-8200
 03-950-8170 03-950-8210
 03-950-8175 33-950-8225

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

Hydrogen fluoride

HF

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.
Note:					mouse	500
#1 Lowest published toxic concentration					rat	1276
inhalation - human 32 PPM.			80		guinea pig	4327
				See Note		

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	MW 20.01	mm Hg.
19.4°C.		at 2.5°C.		400
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)		
-92.3°C.				
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)		
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol.	% Wt.
very soluble				
APPEARANCE AND ODOR				

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Hydrogen Fluoride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 3 PPM, 2 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation and skin absorption.

IRRITATION

RELEVANT SYMPTOMS OF EXPOSURE

Coughing, choking, chills, possible cyanosis and pulmonary edema. Skin contact produces severe burns.

EFFECTS OF CHRONIC EXPOSURE

Slight possibility of fluorosis, weight loss, brittleness of bones, anemia, weakness, discoloration of teeth.

EMERGENCY AND FIRST AID PROCEDURES

Skin - wash thoroughly 15-60 min. Eyes - wash 5 min.
in water - Inhalation, give 100% oxygen as needed. Obtain medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Bismuthic Acid, Fluorene, (Nitric and Lactic Acids) Sodium -

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

Full protection

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

Goggles

GLOVES

SPECIAL

Neoprene

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

W/appropriate filter

Rubber apron - full-face shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in well-ventilated area away from other chemicals.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-267-5507

Hydrazine 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

FORMULA

Hydrazine Dihydrochloride

 $N_2H_4 \cdot 2HCl$

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 - 104.98

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 198°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.42		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR white crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA Flood with water; dry chemical and carbon dioxide
may be used to extinguish fire.

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Hydrazine Dihydrochloride

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 Ingestion - vomiting and convulsions; inhalation - vomiting, respiratory distress, convulsions.

EFFECTS OF CHRONIC EXPOSURE Liver damage, hemolytic anemia and convulsive seizures.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - drink water, get medical aid; inhalation - artificial respiration, oxygen; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

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

goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

rubber
RESPIRATOR

with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside storage preferred; store in standard flammable liquids storage cabinet.
Keep separate from oxidizing materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

Hydrazine hydrate
03-267-5787

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

Hydrazine hydrate

 $N_2H_4 \cdot H_2O$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See Note 1			
#1 LD ₅₀ intravenous - rat 25 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
113.5°C		39.5 at 118.5°C	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-51.7°C		1 at 100°F	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.03			
SOLUBILITY IN WATER ∞ Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

colorless - ammonical and fishy odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
126°C		LOWER
METHOD USED		
O.C.		

EXTINGUISHING MEDIA

Water, dry chemicals and CO₂, alcohol foam -

SPECIAL FIRE FIGHTING PROCEDURES

Water spray to disperse vapors. Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Spontaneous ignition with oxidants such as nitric acid and hydrogen peroxide.

PRODUCT DESIGNATION

Hydrazine hydrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 1 PPM, 1.3 mg/C.M.

CARCINOGENIC

yes

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation, skin absorption

SKIN AND EYE

IRRITATION Severe on liquid contact

RELEVANT SYMPTOMS OF EXPOSURE Inhalation - vomiting, respiratory distress and convulsions;
direct skin contact - burns; ingestion - vomiting and convulsions.

EFFECTS OF CHRONIC EXPOSURE

Liver damage, hemolytic anemia and convulsive seizures.

EMERGENCY AND FIRST AID PROCEDURES

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

Heat and strong oxidizing agents.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Spontaneous ignition with strong oxidants such as nitric acid or H_2O_2 .

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Use water spray to disperse vapors.

WASTE DISPOSAL METHOD

Dilute to non-inflammable mixture.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

Use in hood

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Face shield

MECHANICAL (GENERAL)

GLOVES

Rubber gloves

SPECIAL

RESPIRATOR

With appropriate filter

OTHER PROTECTIVE EQUIPMENT

Full protective clothing recommended.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Maintain under nitrogen atmosphere.

OTHER PRECAUTIONS

Keep away from strong oxidizing agents.

SIGNATURE

DATE

PRODUCT DESIGNATION

Hydrazine Sulfate
03-267-5947

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

Hydrazine sulfate

FORMULA

$$\text{N}_2\text{H}_4\text{H}_2\text{SO}_4$$

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.
lowest published - lethal dose			601		rat	
subcutaneous - rat 250 mg/kg						
intraperitoneal - mouse 250 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT -	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 254°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.378		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless crystal		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water, dry chemical and CO₂

SPECIAL FIRE FIGHTING PROCEDURES

Water spray to disperse hydrazine vapor - wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

May react vigorously with strong oxidizing agents.

PRODUCT DESIGNATION

Hydrazine sulfate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

neoplastic

PRINCIPLE ROUTES OF ABSORPTION

ingestion, skin

SKIN AND EYE

IRRITATION

severe on direct contact

RELEVANT SYMPTOMS OF EXPOSURE

Burns - from direct skin contact.

Ingestion - vomiting and convulsions.

EFFECTS OF CHRONIC EXPOSURE

Liver damage, hemolytic, anemia and convulsive seizures.

EMERGENCY AND FIRST AID PROCEDURES

Skin contact - drench with water; if swallowed - wash mouth, give water to drink, get medical aid; inhalation - oxygen or artificial respiration as necessary.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

Heat and strong oxidizing agents.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Reacts vigorously with strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

flush with water

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Face shield

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

Rubber apron, full face shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

Keep away from strong oxidizing agents

SIGNATURE

DATE

PRODUCT DESIGNATION

Hydrogen Sulfide
03-950-9405
03-950-9425
03-950-9445

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 Hydrogen Sulfide	FORMULA H ₂ S

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 lowest published toxic concentration in air -					Rat	713
inhalation - human 14 PPM.					Mouse	673

SECTION III PHYSICAL DATA MW - 34.08

BOILING POINT -60.4°C. ° F.	VAPOR PRESSURE at 25.5°C. 20 at m. mm Hg.
MELTING POINT -85.5°C. ° F.	VAPOR DENSITY (Air = 1) 1.189
SPECIFIC GRAVITY (H ₂ O = 1) 1.539 at 0°C.	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Colorless; flammable gas, offensive odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA % by vol.

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 45 LOWER 4.3
METHOD USED		

EXTINGUISHING MEDIA

Stop flow of gas. Dry chemical, carbon dioxide, water spray.

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Forms explosive mixtures with air.

PRODUCT DESIGNATION Hydrogen Sulfide	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL TLV - 10 PPM, 15 mg/C.M.	CARCINOGENIC no
PRINCIPLE ROUTES OF ABSORPTION Inhalation of vapor	SKIN AND EYE IRRITATION mild to moderate
REVELANT SYMPTOMS OF EXPOSURE Headache, anosmia, nausea, cough, dizziness, drowsiness, and pulmonary edema.	
EFFECTS OF CHRONIC EXPOSURE Low blood pressure, loss of appetite, weight loss; conjunctivitis and chronic cough.	
EMERGENCY AND FIRST AID PROCEDURES Remove from exposure; give artificial respiration with oxygen if necessary. Obtain medical aid.	
SECTION VI REACTIVITY DATA	
CONDITIONS CONTRIBUTING TO INSTABILITY	
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION	
INCOMPATIBILITY (MATERIALS TO AVOID) (Soda Lime and Air) mixture - explosion hazard.	
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)	GLOVED Rubber
SPECIAL	RESPIRATOR W/proper filter
OTHER PROTECTIVE EQUIPMENT Self-contained breathing apparatus.	
SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Outside storage is preferred away from sources of ignition. Keep away from nitric acid, strong oxydizing materials.	
OTHER PRECAUTIONS Keep from direct sunlight and excessive heat.	
SIGNATURE	DATE

PRODUCT DESIGNATION

03-267-6737

Hydroquinone

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

P dihydroxy benzene

CHEMICAL NAME AND SYNONYMS

FORMULA

1, 4 Benzene diol

 $C_6H_4(OH)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 lowest published toxic dose			320		rat	
skin - mouse 800 mg/kg.			400		mouse	
			200		dog	
			70		cat	
			300		guinea pig	

SECTION III PHYSICAL DATA MW - 110.11

BOILING POINT 286°C	° F.	VAPOR PRESSURE at 132°C	1 mm Hg.
MELTING POINT 171°C	° F.	VAPOR DENSITY (Air = 1) 3.81	
SPECIFIC GRAVITY (H ₂ O = 1) 1.358		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 6		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless crystal salt			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 329°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED CC		LOWER
EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Hydroquinone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 2 mg/C.M.

CARCINOGENIC

neoplastic

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, skin, inhalation of dust

SKIN AND EYE

IRRITATION severe

RELEVANT 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 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

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

PRODUCT DESIGNATION 03-267-8307 4 Hydroxy - 1,2 - Dimethyl benzene

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 3,4 - Xylenol	FORMULA $\text{HO}(\text{C}_6\text{H}_4)(\text{CH}_3)_2$

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.
			400		mouse	
			800		rabbit	
Note:						
Lowest published toxic dose						
skin - mouse 90 mg/kg						

SECTION III PHYSICAL DATA		MW - 122.16
BOILING POINT 225 ° F.	VAPOR PRESSURE mm Hg.	
MELTING POINT 65 ° C	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.02	EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble	VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR white crystal		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES wear self-contained breathing apparatus.
--

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

4 Hydroxy - 1,2 - Dimethylbenzene

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 Headache, dizziness, nausea, vomiting, stomach pain, exhaustion;
skin & eye irritation.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - drink epsom salt 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)

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

PRODUCT DESIGNATION

03-267-8407
4 Hydroxy - 1,3 - 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 FAMILY
CHEMICAL NAME AND SYNONYMS 2,4 - Xylenol	FORMULA $\text{HO}(\text{C}_6\text{H}_3)(\text{CH}_3)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note: Lowest published lethal dose Intraperitoneal - mouse 150 mg/kg			See note			

SECTION III PHYSICAL DATA MW - 122.16

BOILING POINT 212°C	° F.	VAPOR PRESSURE at 120°C	mm Hg. 20
MELTING POINT 26°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.04		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble.		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR yellow-brown liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

4 Hydroxy - 1,3 - Dimethylbenzene

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 Headache, dizziness, nausea, vomiting, stomach pain, exhaustion; skin & eye irritation.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - drink epsom salt solution, 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

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-267-8207
2 Hydroxy 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 FAMILY

CHEMICAL NAME AND SYNONYMS

2,5 Xylenol

FORMULA

 $\text{HO}(\text{C}_6\text{H}_3)(\text{CH}_3)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			444		rat	
			383		mouse	
			938		rabbit	

SECTION III PHYSICAL DATA MW - 122.16

BOILING POINT 212°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 76°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR white crystal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2 Hydrozy 1,4 Dimethylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

yes

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE

IRRITATION severe

REVELANT SYMPTOMS OF EXPOSURE Headache, dizziness, nausea, vomiting, stomach pain, exhaustion;
skin & eye irritation.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - drink epsom salt 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)

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
GLOVES

SPECIAL

rubber
RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-267-8647

O - Hydroxydiphenyl

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 hydroxybiphenyl

FORMULA

 $C_6H_5(C_6H_4)OH$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			2700		Rat	

SECTION III PHYSICAL DATA MW - 170.20

BOILING POINT 286°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 57°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR white solid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

carbon dioxide or dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

water may cause frothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

O-Hydroxydiphenyl

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

Nausea, vomiting, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE

Irritation and lesions of respiratory system.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - get medical aid, gastric lavage;
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

SPECIAL

polyvinyl alcohol

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-267-8677
P - Hydroxydiphenyl

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 4 hydroxybiphenyl	FORMULA $C_{12}H_{10}(C_6H_5)OH$

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

BOILING POINT 306°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 165°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR white solid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA carbon dioxide or dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES water may cause frothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
P-Hydroxydiphenyl

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL none available CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE
inhalation, ingestion IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
Nausea, vomiting, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE
Irritation and lesions of respiratory system.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - get medical aid, gastric lavage; 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 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

PRODUCT DESIGNATION

03-202-2903
8 Hydroxy-5-Quinoline
Sulfonic Acid

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
<u>Oxyquinoline Sulfate</u>	
CHEMICAL NAME AND SYNONYMS	FORMULA
8 hydroxy -5 - quinoline sulfonic acid	$C_9H_7NO_4S$

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 - 225.22

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
-			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
275°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
-			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Slightly soluble			
APPEARANCE AND ODOR			
Pale yellow needle-like crystals.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
None available		
METHOD USED		LOWER

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

8 hydroxy - 5 Quinoline Sulfonic Acid

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Retina damage, eye & mucous membrane irritation, cyanosis, headache, dizziness.

EFFECTS OF CHRONIC EXPOSURE

Possible liver damage

EMERGENCY AND FIRST AID PROCEDURES If swallowed - induce vomiting, get medical aid; inhalation - rest; wash from skin and 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

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

INTERNAL DISTRIBUTION

1. R. G. Affel	48. H. C. Graham
2. J. K. Bair	49. C. R. Grubb
3. M. A. Baker	50. W. F. Harris
4. H. C. Beeson	51. R. M. Hartman
5. H. Blauer	52. H. H. Haymond
6. B. G. Blaylock	53. G. S. Henderson
7. W. A. Blevins	54. G. R. Hicks
8. E. E. Beauchamp	55. M. R. Hill
9. B. M. Beeler	56. H. W. Hoffman
10. J. Bolinsky	57. J. T. Howe
11. C. J. Borkowski	58. S. S. Hurtt
12. B. M. Boyer	59. J. D. Hutchins
13. D. M. Bradburn	60. R. S. Jackson
14. R. K. Branum	61. K. E. Jamison
15. J. P. Breillat	62. R. G. Jenness
16. D. Brogan	63. L. P. Jernigan
17. C. D. Cagle	64. R. H. Jones
18. G. C. Cain	65. E. M. King
19. F. N. Case	66. H. V. Klaus
20. G. H. Coleman	67. E. H. Kobisk
21. G. H. Callaway	68. E. D. Lance
22. R. E. Canning	69. L. C. Lasher
23. C. C. Coutant	70. J. Ledford
24. V. T. Carmony	71. E. M. Lees
25. W. E. Childress	72. R. L. Lines
26. C. E. Clayton	73. J. C. Lyell
27. C. R. Clough	74. J. Macres
28. B. L. Corbett	75. R. E. MacPherson
29. L. T. Corbin	76. F. W. Mannings
30. J. A. Cox	77. C. McBee
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