27
5-19-77
5-10-77
25-10-77

ORNL/TM-5722
(Volume II of ORNL/TM-5721)

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

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

MASTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION FOR THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

The following pages are an exact
representation of what is in the original
document folder.

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
Price: Printed Copy \$13.50; Microfiche \$3.00

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the Energy Research and Development Administration/United States Nuclear Regulatory Commission, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

ORNL/TM-5722
(Volume II of ORNL/TM-5721)

Contract No. W-7405-eng-26

HEALTH DIVISION
Industrial Hygiene Department

MATERIALS SAFETY DATA SHEETS
THE BASIS FOR CONTROL OF TOXIC CHEMICALS

VOLUME II

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

Date Published: May 1977

NOTICE
This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Energy Research and Development Administration, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

NOTICE This document contains information of a preliminary nature. It is subject to revision or correction and therefore does not represent a final report.

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

MASTER

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

**THIS PAGE
WAS INTENTIONALLY
LEFT BLANK**

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 M.D.

T. A. Lincoln, Director
Health Division

N. E. Bolton

N. E. Bolton
Industrial Hygiene Department
Health Division

**THIS PAGE
WAS INTENTIONALLY
LEFT BLANK**

TABLE OF CONTENTS

FOREWORD

1. Control of Toxic Materials

Introduction
Mechanics of System
Results and Discussion
Conclusion
Acknowledgement
References

2. Glossary of Terms

3. Material Safety Data Sheets

(Continuation of ORNL TM5721)

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, deletions 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

List of Figures

- 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

10 PPM

CARCINOGENIC

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 WEIGHT, DERMATITIS, LOSS OF MEMORY, AND ANOREXIA.

EMERGENCY AND FIRST AID PROCEDURES REMOVE FROM EXPOSURE, IF NECESSARY GIVE ARTIFICIAL RESPIRATION. DO NOT GIVE STIMULANTS. OBTAIN MEDICAL AID.

UNUSUAL HAZARDS DELAYED LIVER OR KIDNEY SYMPTOMS. WHEN HEATED RELEASES PHOSGENE. 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

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.	RADG	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				
4455-65-0097		ACID TRICHLOROACETIC	BTL	6	4455	14929	03-20-74				
4455-65-0145		ACID TRICHLOROACETIC	BTL	6	4455	09944	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
1390-65-0050		AMYL 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
3349-65-0002		BENZENE	BTL	1	3349	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&CRACS	BTL	4	3390	07846	03-05-74				
3390-65-0025		BENZENE&BENZOL&CRACS	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 INDUSTRIAL HYGIENE WORKPLACE SAMPLING

1 SAMPLE NO.* 8					6 BUILDING 11					12 ROOM 16					17 AREA 21					DATE 22 MO DAY YR 27					28 TIME 31					32 SAMPLED BY (BADGE NO.) 42					79 80																		
00236																														1 0																							
TYPE AP 82 AO 3MEAR 9 7 9 9 10										METHOD										SAMPLING DATA 29 30 DURATION 33 34										RATE										45 46 VOLUME 52										79 80			
																																																		2 0			
																																																		2 1			
																																																		2 2			
																																																		2 3			
																																																		2 4			
																																																		2 5			
																																																		2 6			
																																																		2 7			
																																																		2 8			
																																																		2 9			
6 CONTAMINANT										30 31 CONCENTRATION										35 36 UNITS										40 41 COMMENTS										65 66 TLV 70										79 80			
																																																		3 0			
																																																		3 1			
																																																		3 2			
																																																		3 3			
																																																		3 4			
																																																		3 5			
																																																		3 6			
																																																		3 7			
																																																		3 8			
																																																		3 9			
8 DEPT. 9 10 P/R 11										BADGE										PERSON 21 22 IN AREA 23 SAMPL 24										PERSONNEL DATA NAME										43 44 COMMENTS										63		79 80	
																																																		4 0			
																																																		4 1			
																																																		4 2			
																																																		4 3			
																																																		4 4			
																																																		4 5			
																																																		4 6			
																																																		4 7			
																																																		4 8			
																																																		4 9			

UCN-10987
(S 10-73)

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

Figure 4

ORNL DWG. 74-4337

WORKPLACE SAMPLING HISTORY									
REPORT DATE 03/09/74					PAGE NO. 2 REPORT NO. 803811				
TYPE	METHOD	DURATION	RATE	VOLUME	CONTAMINANT	CONCENTRATION	UNITS	COMMENTS	TLV
BZ	DRAEGER TUBE				OZONE	0.3	PPM	ELECTRODE WELDING BLACK	0.1
BZ	DRAEGER TUBE				NITROGEN DIOXIDE	<0.1	PPM	IRON, GALVANIZED; HELIARC 5C	
BZ	.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	15616			
TYPE	METHOD	DURATION	RATE	VOLUME	CONTAMINANT	CONCENTRATION	UNITS	COMMENTS	TLV
BZ	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
SMEAR	WHATMAN 41-1 FT2				LEAD	0.257	MG	LEDGE	
SMEAR	WHATMAN 41-1 FT2				LEAD	0.494	MG	CONDUIT	
SMEAR	WHATMAN 41-1 FT2				LEAD	0.344	MG	CONDUIT	
SMEAR	WHATMAN 41-1 FT2				LEAD	0.026	MG	LEDGE	
SMEAR	WHATMAN 41-1 FT2				LEAD	0.312	MG	WALL	
SMEAR	WHATMAN 41-1 FT2				LEAD	0.385	MG	WALL	
SMEAR	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								

1-15

Figure 5

References

1. C. H. Hine, and N. W. Jacobsen, "Safe Handling Procedures for Compounds Developed by the Petro-Chemical Industry," Amer. Ind. Hyg. Assoc. Quart. 15, 141 (1954).
2. Recommended System for the Identification of the Fire Hazards of Materials, NFPA No. 704M-1966, National Fire Protection Association, Boston (1966).
3. Criteria for a Recommended Standard . . . Occupational Exposure to Asbestos, HSM 72-10267, National Institute of Occupational Safety and Health, Washington, D. C. (1972).
4. Threshold Limit Values for Chemical Substances in Workroom Air, American Conference of Government Industrial Hygienist., Cincinnati, Ohio (1973).

2. GLOSSARY OF TERMS

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

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

Ringling 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

03-278-0308
IndeneMATERIAL SAFETY
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 Indonaphthene	FORMULA $C_{10}H_8$

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						
subcutaneous - rat 100 mg/kg.						

SECTION III PHYSICAL DATA MW - 116.15

BOILING POINT 182°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -2°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.99		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 spray carbon dioxide, dry chemical or alcohol foam.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Indene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 10 PPM, 45 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION slight

REVELANT SYMPTOMS OF EXPOSURE Irritation of mucous membranes and lungs.

pulmonary edema.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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 Iodine 03-074-1009

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 Iodine	FORMULA I ₂

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
Note: Lowest published lethal dose Oral - human 2000 mg/kg.			See Note		

SECTION III PHYSICAL DATA		MW 253.84
BOILING POINT 183°C.	° F.	VAPOR PRESSURE at 38.7°C.
MELTING POINT 112.9°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 4.93		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR
Rhombic, violet-black crystals, metallic luster - characteristic odor.

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
Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Emits toxic fumes.

PRODUCT DESIGNATION
Iodine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.1 PPM, 1 mg/CM. (Ceiling value)

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation

IRRITATION

Possible skin sensitizer

REVEALANT SYMPTOMS OF EXPOSURE Lachrymation, blephoritis, rhinitis, catarrhal stomatitis, and pharyngitis, eye irritation.

EFFECTS OF CHRONIC EXPOSURE

Irritation and nervousness.

EMERGENCY AND FIRST AID PROCEDURES

Remove from exposure; rest and keep warm; obtain medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Certain Carbides, Acetaldehyde, Acetylene, Aluminum,

Ammonia, Antimony, Bromine Penta fluoride, Cesium Monoxide, Cuprous Acetylide.

HAZARDOUS DECOMPOSITION PRODUCTS

When heated releases highly toxic fumes of Iodine.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Cover with weak reducing agent such as hypobisulfites or ferrous salts. Transfer sludge into large container of water and neutralize with soda ash.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
W/appropriate filter

OTHER PROTECTIVE EQUIPMENT

Self-contained breathing apparatus.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Protect container against physical damage; store in cool, dry area away from sunlight.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-278-2708
2 Iodo - 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

Iodo-M-Xylene 2

FORMULA

$I C_6H_2(CH_3)_2$

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 - 232.07

BOILING POINT 230°C	° 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 insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR clear 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. 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 Iodo - 1,3 - Dimethylbenzene

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 respiratory tract, disturbance of vision,
dizziness, nausea, collapse, coma; burning of skin and eyes.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, blood and liver damage.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, get medical aid; ingestion - give
saline cathartics and demulcents, 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

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside storage preferred; inside storage flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-278-2808

2 - Iodo - 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

Iodo - P - Xylene 2

FORMULA

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

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 232.07

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
230 ⁰ C		at 114 ⁰ C	20
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.62			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
insoluble			
APPEARANCE AND ODOR			
clear liquid			

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. 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 Iodo - 1,4 - Dimethylbenzene

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 respiratory tract, disturbance of vision, dizziness, nausea, collapse, coma; burning of skin & eyes.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, blood and liver damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, get medical aid; ingestion - give saline water 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

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside storage preferred; inside storage flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-278-1808
IodobenzeneMATERIAL SAFETY
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 iodide

FORMULA

 C_6H_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 - 204.02

BOILING POINT 188.5 °F.	VAPOR PRESSURE at 71°C	12 mm Hg.
MELTING POINT -31.3 °F.	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 colorless liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	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

Iodobenzene

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

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 03-278-2308 O-Iodobenzoyl 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 2 Iodobenzoyl Chloride	FORMULA IC ₆ H ₄ 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 - 266.98
BOILING POINT ° F.	VAPOR PRESSURE at 159°C	mm Hg. 29
MELTING POINT 31°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 Crystalline		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 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-Iodobenzoyl 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 respiratory system, skin & eye burns,
mouth and digestive tract burns.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES If swallowed - drink water, milk of magnesia, get medical
aid; inhalation - rest, oxygen, artificial respiration; 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

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

PRODUCT DESIGNATION

03-278-2908
4 - Iodo-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 Iodo-M-Xylene 4	FORMULA $\text{IC}_6\text{H}_3(\text{CH}_3)_2$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 232.07

BOILING POINT not available	° F.	VAPOR PRESSURE at 113°C	mm Hg. 20
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 clear 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. 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
4-Iodo-1,3-Dimethylbenzene

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 respiratory tract; disturbance of vision, dizziness, nausea, collapse, coma; burning of skin & eyes.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, blood & liver damage.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, get medical aid; if swallowed - give saline water cathartics and demulcents, get medical aid; wash 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
	Self-contained
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Outside storage preferred; inside storage flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-278-3308
O-Iododiphenyl

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-Iododiphenyl	FORMULA IC 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 192°C at 36 mm	° F.	VAPOR PRESSURE at 175°C	MW - 280.11	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)		
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)		
1.60				
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 none available	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-Iododiphenyl

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 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

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-278-3408 P-Iododiphenyl

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-Iododiphenyl	FORMULA $C_{12}H_9I$

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		MW - 280.11
BOILING POINT 320°C	° F.	VAPOR PRESSURE at 183 mm Hg.
MELTING POINT 113°C	° F.	VAPOR DENSITY (Air = 1) 11
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 colorless crystal		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT none available	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-Iododiphenyl

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
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
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 03-278-4708 M-Iodotoluene
--

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-Tolyl Iodide	FORMULA $\text{C}_7\text{H}_7\text{CH}_2\text{I}$

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 - 218.05
BOILING POINT 213°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.70		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 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

M-Iodotoluene

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 irritation
of digestive tract if swallowed.

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

03-278-4908
P-Iodotoluene

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 Iodide

FORMULA

$\text{IC}_6\text{H}_4\text{CH}_3$

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	° F.	VAPOR PRESSURE	mm Hg.
212°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
36°C			
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			
white 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, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Iodotoluene

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
irritation of digestive tract if swallowed.

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

03-212-5004
Iso amyl 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

Banana oil
CHEMICAL NAME AND SYNONYMS

FORMULA

3 methyl butanol acetateCH₃COOCH₂CH(CH₃)C₂H₅

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			

SECTION III PHYSICAL DATA MW - 130.2

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
<u>142° C</u>			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
		<u>4.5</u>	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
<u>0.9</u>			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
<u>Slight</u>			
APPEARANCE AND ODOR			
<u>Liquid - banana-like odor</u>			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 7.5 LOWER 1.0
<u>77° F</u>		
METHOD USED		

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

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Iso Amyl Acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 100 PPM, 525 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

Severe

REVELANT SYMPTOMS OF EXPOSURE

Irritation of respiratory tract, intoxication,

eye irritation, throat dryness.

EFFECTS OF CHRONIC EXPOSURE

Kidney damage

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - remove from exposure, artificial respiration
as necessary; wash from eyes or skin. Ingestion - gastric lavage.

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

03-222-2741
Iso-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

Isobutyl Acetate

FORMULA

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

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	lethal concentration					
in air						
inhalation - rat	8000 PPM					

SECTION III PHYSICAL DATA MW - 116.16

BOILING POINT 117°C	° F.	VAPOR PRESSURE at 25°C	mm Hg.
MELTING POINT -99°C	° F.	VAPOR DENSITY (Air = 1)	4.0
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.87			
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.6		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid, fruit-like odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 64°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED CC		LOWER

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Iso-Butyl Acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

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

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Moderate

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

EFFECTS OF CHRONIC EXPOSURE

Fatigue, loss of weight, blood changes.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

Can react with oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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 03-208-0942 Isobutyl 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 Isopropyl carbinol	FORMULA (CH ₃) ₂ CHCH ₂ 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.
			2460		Rat	
				4240	Rabbit	

SECTION III PHYSICAL DATA		MW - 74.12
BOILING POINT 108°C	° F.	VAPOR PRESSURE at 21.7°C
MELTING POINT -108°C	° F.	VAPOR DENSITY (Air = 1) 2.55
SPECIFIC GRAVITY (H ₂ O = 1) 0.805		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 10		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Clear liquid, sweet odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 82°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 10.9 LOWER 1.7
METHOD USED		

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Isobutyl alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 50 PPM, 150 mg/C.M.

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

Some

RELEVANT SYMPTOMS OF EXPOSURE

Slight liver & kidney damage, eye irritation, narcosis

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 (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

03-222-9271
Iso-butylene Bromide

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

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

TRADE NAME AND SYNONYMS

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

FORMULA

1,2 dibromoisobutane

(CH₃)₂ CBrCH₂ 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 - 215.94

BOILING POINT 149°C at 737 ml	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -70.3°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.76			
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 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

Iso-butylene bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Eye irritation, headache, vomiting, drowsiness, narcosis, liver & kidney damage.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, liver & kidney damage

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear self contained breathing apparatus.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

Rubber
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

03-223-2312
Iso-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 Iodo-2 Methyl Propane	FORMULA (CH ₃) ₂ CHCH ₂ 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 - 184.03

BOILING POINT 121°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -94°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 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

Isobutyl 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 depression.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-278-5808
Isophorone

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

Isoacetophenone

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Trimethyl-3 Cyclohexene-5-one

FORMULA

COCHC(CH₃)CH₂C(CH₃)₂CH₂

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			2330		rat	

SECTION III PHYSICAL DATA MW - 138.20

BOILING POINT 215°C	° F.	VAPOR PRESSURE at 38°C	mm Hg. 1
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1) 4.77	
SPECIFIC GRAVITY (H ₂ O = 1) 0.93		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR water white liquid, peppermint-like odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 205°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 3.8%
METHOD USED O.C.		LOWER 0.8%
EXTINGUISHING MEDIA Foam, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Isophorone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

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

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation

SKIN AND EYE

IRRITATION moderate to severe

RELEVANT SYMPTOMS OF EXPOSURE Eye, nose and throat irritation, nausea, headache, dizziness, faintness, inebriation.

EFFECTS OF CHRONIC EXPOSURE

Kidney poison.

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

03-329-1345
03-329-1305
Iso-Propyl 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 Isopropyl Acetate	FORMULA C_3H_7COOH

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.
			3000		rat	
Note:						
Lowest published toxic concentration in air				See Note		
inhalation - human 200 PPM						

SECTION III PHYSICAL DATA MW 102.13

BOILING POINT 89°C	° F.	VAPOR PRESSURE at 17°C	mm Hg. 40
MELTING POINT -73°C	° F.	VAPOR DENSITY (Air = 1) 3.52	
SPECIFIC GRAVITY (H ₂ O = 1) 0.87		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 3		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 40°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 7.8 LOWER 1.8
METHOD USED		

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Iso-Propyl Acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 250 PPM, 950 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Eye irritation, respiratory passage irritation

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

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
03-247-6209
03-247-6269
Iso-propyl 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 Diisopropyl ether	FORMULA (C ₃ H ₇) ₂ O

372

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 800 PPM						

SECTION III PHYSICAL DATA		MW - 102.17
BOILING POINT 68.5 C	° F.	VAPOR PRESSURE at 25°C 150 mm Hg.
MELTING POINT -60°C	° F.	VAPOR DENSITY (Air = 1) 3.52
SPECIFIC GRAVITY (H ₂ O = 1) 0.72		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, ethereal odor		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT -18°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 7.9% LOWER 1.4%
METHOD USED C.C.		
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Iso-propyl ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 250 PPM, 1050 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

anesthesia action, irritating to mucous membranes

EFFECTS OF CHRONIC EXPOSURE

dermatitis

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)

reacts with oxygen to produce explosive peroxides.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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

detached outside storage preferred. For inside storage - standard flammable
liquids room or storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-329-6305
Isopropyl 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

FORMULA

2-Iodopropane

 $\text{CH}_3\text{CHI.CH}_3$

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 - 169.99

BOILING POINT 90°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -90°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.74		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.14		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, 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

Isopropyl 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

PRODUCT DESIGNATION 03-082-0102 Lead 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 Lead Acetate	FORMULA $Pb(C_2H_3O_2)_2 \cdot 3H_2O$

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.	
Note:			See Note				
Lowest published lethal dose							
Oral - rat 11 mg/kg.							

SECTION III PHYSICAL DATA		MW 379.33
BOILING POINT d 200°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -H ₂ O, 75°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.55		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 45.6 at 15°C.		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 None available		
SPECIAL FIRE FIGHTING PROCEDURES		

UNUSUAL FIRE AND EXPLOSION HAZARDS When heated, it emits acrid fumes.
--

PRODUCT DESIGNATION
Lead acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	TLV - 0.26 Mg/C.M.	CARCINOGENIC	Yes
PRINCIPLE ROUTES OF ABSORPTION	Inhalation, ingestion	SKIN AND EYE IRRITATION	Slight
RELEVANT SYMPTOMS OF EXPOSURE	Abdominal pain, diarrhea, constipation, loss of appetite, muscular weakness, headache, blue line on gums, vomiting.		
EFFECTS OF CHRONIC EXPOSURE	Loss of appetite, constipation, blue line on gums, loss of weight.		
EMERGENCY AND FIRST AID PROCEDURES	Ingestion - give egg white and milk, also gastric lavage with magnesium sulfate solution; inhalation - rest, keep warm, 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 Face shield
MECHANICAL (GENERAL)	GLOVES Rubber
SPECIAL	RESPIRATOR With proper filter
OTHER PROTECTIVE EQUIPMENT Self-contained respirator.	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-082-1802 Lead 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 Lead chloride	FORMULA <chem>PbCl2</chem>

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 oral - guinea pig 2000 Mg/kg.			See Note 1			

SECTION III PHYSICAL DATA		MW 278.1
BOILING POINT 950° C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 501° C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 5.85		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White crystal		

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
Lead Chlorite

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.15 Mg/C.M. CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE
Inhalation, ingestion IRRITATION No

REVELANT SYMPTOMS OF EXPOSURE Abdominal pain, diarrhea, constipation, loss of appetite,
muscular weakness, headache, blue line on gums, vomiting.

EFFECTS OF CHRONIC EXPOSURE
Loss of appetite, constipation, blue line on gums, loss of weight.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give egg white, milk or tannin, also
gastric lavage with solution of magnesium sulfate; if inhaled - rest, keep
warm, 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

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

03-082-3002
Lead Dioxide

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

Lead Dioxide

FORMULA

PbO₂

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 - guinea pig 115 mg/kg.						

SECTION III PHYSICAL DATA MW 239.19

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT ° F.	VAPOR DENSITY (Air = 1)
d 290° C.	EVAPORATION RATE (_____ = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	
9.375	
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

Brown crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

N/A

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

PRODUCT DESIGNATION
Lead Dioxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.15 Mg/C.M. CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION Inhalation, ingestion SKIN AND EYE IRRITATION No

REVELANT SYMPTOMS OF EXPOSURE Abdominal pain, diarrhea, constipation, loss of appotito, muscular weakness, headache, blue line on gums, pyorrhea, vomiting.

EFFECTS OF CHRONIC EXPOSURE Loss of appetite, constipation, blue line on gums, loss of weight.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give egg white, milk or tannin, also gastric lavage with solution of magnesium sulfate if inhaled - rest, keep warm, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
Oxidizing agent

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID) Aluminum carbide, barium sulfide, boron, calcium sulfide, hydrogen sulfide, hydroxylamine, molybdenum, Phenyl hydrazine, phosphorous.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

03-082-4802
Lead MetalMATERIAL SAFETY
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 Lead	FORMULA Pb

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 - guinea pig 100 mg/kg.						

SECTION III PHYSICAL DATA MW 207.19

BOILING POINT 1744° C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 327.5	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 11.3436		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Silver blue soft metal.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA
Not available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Lead Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.15 mg/C.M.

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust or fume, ingestion

SKIN AND EYE

IRRITATION

No

RELEVANT SYMPTOMS OF EXPOSURE Abdominal pain, constipation, diarrhea, loss of appetite, muscular weakness, headache, line on gums, pyorrhea.

EFFECTS OF CHRONIC EXPOSURE

Loss of appetite, muscular weakness, loss of weight, blue line on gums.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give egg white, milk or tannin, also gastric lavage with 1% solution of magnesium sulfate if inhaled - rest, keep warm, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Ammonium nitrate, hydrogen peroxide, zirconium.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 03-082-5402 Lead 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 Lead Nitrate	FORMULA $Pb(NO_3)_2$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Lowest published lethal dose			See Note			
intraperitoneal - rat	270 mg/kg.					
oral - guinea pig	1330 mg/kg.					

SECTION III PHYSICAL DATA 331.2	
BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT d - 470° C. ° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 4.53	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 38.8	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 Water

SPECIAL FIRE FIGHTING PROCEDURES Flood with water early in fire. Wear self-contained breathing apparatus.
--

UNUSUAL FIRE AND EXPLOSION HAZARDS Decomposes at 410° F. to give off toxic nitrogen oxide fumes.

PRODUCT DESIGNATION
Lead Nitrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.24 mg/M³ CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION Inhalation of dust or ingestion SKIN AND EYE IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE Headache, muscular weakness, constipation, collapse, gastroenteric symptoms, abdominal pain, vomiting.

EFFECTS OF CHRONIC EXPOSURE Loss of appetite, anemia, loss of weight, blue line on gums.

EMERGENCY AND FIRST AID PROCEDURES If inhaled - rest, get medical attention; if swallowed - wash mouth, give emetic, then epsom salts 30g/250 ml warm water; get medical attention, wash from skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Reacts with sparks on red hot carbon.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

03-082-6002
Lead Oxide (mono)

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 C.I. 77577, C.I. Pigment yellow 46	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Litharge	FORMULA PbO

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Intraperitoneal - rat	LD50 450 mg/kg.		See Note			

SECTION III PHYSICAL DATA

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 888° C. ° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 9.53	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.0068	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellow powder	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Flood with water

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Lead Oxide (mono)

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - TWA - 0.16 mg/m³ CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust or ingestion SKIN AND EYE
IRRITATION No

RELEVANT SYMPTOMS OF EXPOSURE Headache, muscular weakness, constipation, collapse, gastro-
enteric symptoms, abdominal pain, vomiting.

EFFECTS OF CHRONIC EXPOSURE
Loss of appetite, anemia, loss of weight, blue line on gums.

EMERGENCY AND FIRST AID PROCEDURES If inhaled - rest, get medical attention; if swallowed - wash
mouth, give emetic, then epsom salts 30 g/250 ml. of hot water, get medical attention;
wash from skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Face shield
--	---

MECHANICAL (GENERAL)	GLOVES
----------------------	--------

SPECIAL	RESPIRATOR With appropriate filter
---------	---------------------------------------

OTHER PROTECTIVE EQUIPMENT
Face shield

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-082-7202
Lead Sulfate

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

C I pigment white 3

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

White lead

FORMULA

PbSO₄

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 LD ₅₀ intraperitoneal - guinea pig	300 mg/kg.		See Note 1			

SECTION III PHYSICAL DATA 303.27

BOILING POINT N/A	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 1170	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 6.2		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.0028		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR White powder			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Will not burn	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Water		

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

UCN-11322
(3 10-74)

3-507

PRODUCT DESIGNATION
Lead Sulfate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV -- 0.22 mg/m³

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust or ingestion

SKIN AND EYE
IRRITATION No

REVELANT SYMPTOMS OF EXPOSURE Headache, muscular weakness, constipation, collapse, gastro-
~~enteric symptoms, abdominal pain, vomiting.~~

EFFECTS OF CHRONIC EXPOSURE
Loss of appetite, anemia, loss of weight, blue line on gums.

EMERGENCY AND FIRST AID PROCEDURES If inhaled - rest, get medical attention. If swallowed -
wash mouth, give emetic, then epsom salts 30 g/250 ml. hot water, get medical
attention; wash from skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)
Reacts with lithium carbide exothermally.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Face shield

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

03-084-1003
Lithium Aluminum Hydride

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

Lithium Aluminum Hydride

FORMULA

LiAlH_4

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)	
d 125°C.			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.917			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
d			
APPEARANCE AND ODOR			
White powder			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		
Suitable dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES		
Do not use water. Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		
Decomposes at 257 to form LiH, aluminum and hydrogen gas.		

PRODUCT DESIGNATION

Lithium Aluminum Hydride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - TWA 0.119 mg/M³

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust, ingestion

SKIN AND EYE

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Salivation, nausea, vomiting, diarrhea, loose or bloody stools, irritation of skin and eyes.

EFFECTS OF CHRONIC EXPOSURE

Emphysema, kidney damage.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, keep warm, get medical attention. If swallowed - wash mouth, drink water, then 1% acetic acid, get medical attention. Wash skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Violent reaction with oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Produces hydrogen.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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 appropriate filter

OTHER PROTECTIVE EQUIPMENT

Face shield and protective clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-084-5003 Lithium Fluoride

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 Lithium Fluoride	FORMULA LiF

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀
			ORAL	PERCUT.	SPECIES
Lowest published lethal dose			See Notes		
oral guinea pig 200 mg/kg					
subcutaneous - guinea pig 2000 mg/kg.					

SECTION III PHYSICAL DATA	
BOILING POINT 1670° C.	VAPOR PRESSURE mm Hg.
MELTING POINT 870° C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.295	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.13 at 0° C.	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White powder	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT Does not burn	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES May produce HF with water.
UNUSUAL FIRE AND EXPLOSION HAZARDS Wear self-contained mask.

PRODUCT DESIGNATION

Lithium Fluoride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 2.4 mg/M³

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust (mainly) ingestion

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Vomiting, abdominal pain, diarrhea, convulsions, muscular

weakness, salivation, nausea, irritation of respiratory system.

EFFECTS OF CHRONIC EXPOSURE

Increase in fluoride content of teeth.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, keep warm, get medical attention; if

swallowed - wash mouth, drink water, then milk of magnesia, 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)

May produce HF with water.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Face shield

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

Face shield and protective clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-084-5953 03-084-6003 Lithium Hydroxide

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 Lithium Hydroxide	FORMULA <chem>LiOH.H2O</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 925° C.	VAPOR PRESSURE mm Hg.
MELTING POINT 445° C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.54	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 22.3	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White crystals	

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

PRODUCT DESIGNATION

Lithium Hydroxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available 2 mg/C.M. (NaOH)CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION SevereRELEVANT SYMPTOMS OF EXPOSURE Severe attack of membranes in digestive tract and stomach, anorexia, nausea, vomiting, diarrhea, salivation, irritation of skin and eyes.

EFFECTS OF CHRONIC EXPOSURE

Kidney damage.EMERGENCY AND FIRST AID PROCEDURES Wash from skin and eyes - if swallowed - wash mouth, drink water, then 1% vinegar, get medical aid, if inhaled - rest, keep warm, get medical aid.

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

Face shield

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

Protective clothing

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-084-8003
Lithium MetalMATERIAL SAFETY
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

Lithium

Li

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 A.W - 6.939

BOILING POINT 1330 ⁰ C.	⁰ F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 180.55 ⁰ C.	⁰ F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.534		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Reacts		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR Silver metal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Use dry graphite, soda ash or sodium chloride.

SPECIAL FIRE FIGHTING PROCEDURES

Wear protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Reacts with water to produce hydrogen gas.

PRODUCT DESIGNATION
Lithium Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	Not available	CARCINOGENIC	No
PRINCIPLE ROUTES OF ABSORPTION	Inhalation of fumes, ingestion (mainly)	SKIN AND EYE IRRITATION	Severe
RELEVANT SYMPTOMS OF EXPOSURE	Salivation, nausea, vomiting, diarrhea, severe internal attack, extreme irritation of respiratory system, severe skin and eye attack.		
EFFECTS OF CHRONIC EXPOSURE	Emphysema, kidney damage.		
EMERGENCY AND FIRST AID PROCEDURES	Inhalation - rest, keep warm, get medical aid; if swallowed - wash mouth, drink water, then 1% vinegar, get medical aid; wash skin and eyes, get medical aid.		

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Reacts rapidly with water, fluorinated hydrocarbons.

HAZARDOUS DECOMPOSITION PRODUCTS

Produces hydrogen gas when it reacts with water.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
	Face shield
MECHANICAL (GENERAL)	GLOVES
	Leather
SPECIAL	RESPIRATOR
	With proper filter
OTHER PROTECTIVE EQUIPMENT	
Protective clothing.	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in moisture free place; protect against physical damage.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-296-2919
2,4 LutidineMATERIAL SAFETY
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 Dimethyl Pyridine

FORMULA

 $C_5NH_3(CH_3)_2$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 107.15

BOILING POINT 157°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° 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 20		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR clear liquid - fish-like odor			

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 goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
2,4 Lutidine

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, 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 If swallowed - induce vomiting, get medical aid;
inhalation - artificial respiration and oxygen as necessary; wash from
skin and 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

Outside storage preferred, store inside in a flammable liquids
storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-091-2006
Mercuric 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

Corrosive sublimate

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Mercuric Chloride

FORMULA

Hg Cl₂

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.
			37		Rat	
			10	23	Mouse	
#1 lowest published toxic dose						
Oral - human 1 mg/kg.						

SECTION III PHYSICAL DATA MW - 271.52

BOILING POINT 302° C.	° F.	VAPOR PRESSURE at 136.2° C.	1 mm Hg.
MELTING POINT 276° C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 5.44		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 6.9		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR White powder			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Mercuric Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.067 Mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Skin and eyes ingestion, inhalation

SKIN AND EYE

IRRITATION Severe injury to cornea

RELEVANT SYMPTOMS OF EXPOSURE Ingestion - immediate severe gastroenteric distress; skin absorption - irritation, dermatitis, decolorization of nails, ulcerization of mucous membranes and eyes, severe systemic effects.

EFFECTS OF CHRONIC EXPOSURE Liver and kidney damage, neurological disorders, psychic disturbance (timidity) loosening of teeth.

EMERGENCY AND FIRST AID PROCEDURES Repeated soap and water wash to remove from skin; if swallowed - give teaspoon salt in warm water to induce vomiting, then milk or egg white, get medical aid; inhalation of dust - rest, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Reacts with acetylene to produce explosive compounds.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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

OTHER PROTECTIVE EQUIPMENT

Rubber apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in tightly closed containers in well-ventilated area.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION Mercuric Iodide 03-091-3006
--

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 Mercuric Iodide	FORMULA HgI_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.
			40		Rat	
			80		Mouse	
Lowest published lethal dose						
Oral - human - 357 mg/kg.			See Note			

SECTION III PHYSICAL DATA MW 454.45

BOILING POINT subl. 354° C.	° F.	VAPOR PRESSURE at 157.5° C.	mm Hg.
MELTING POINT 259° C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 6.36		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.01		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR Red, tetrahedral 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
Mercuric Iodide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 0.113 mg/m³

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Skin absorption, ingestion, inhalation

SKIN AND EYE
IRRITATION Slight

REVEALANT SYMPTOMS OF EXPOSURE Ingestion produces immediate severe gastroenteric distress, excessive salivation, pain on chewing, extreme timidity, dermatitis on skin and inflammation of mucous membranes and eyes.

EFFECTS OF CHRONIC EXPOSURE Liver and kidney damage, neurological disorders. Psychic disturbances (timidity), dermatitis, and inflammation of mucous membranes, loosening of teeth.

EMERGENCY AND FIRST AID PROCEDURES If conscious, give teaspoon salt in glass warm water. To induce vomiting, give milk or egg white afterward. If on skin, remove by washing with soap and water.

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

Face shield

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

PRODUCT DESIGNATION
03-091-4006 03-091-4016 Mercuric 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 Mercuric Nitrate	FORMULA $\text{Hg}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 LD ₅₀ Intraperitoneal - mouse 8 mg/kg.			See Note 1			

SECTION III PHYSICAL DATA		MW - 342.4
BOILING POINT decomposes	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 79° C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 4.3		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O V.S.		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White deliquescent powder		

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

EXTINGUISHING MEDIA Water

SPECIAL FIRE FIGHTING PROCEDURES Wear mask to protect from NO ₂ fumes.
--

UNUSUAL FIRE AND EXPLOSION HAZARDS Decomposes to produce NO ₂ fumes.
--

PRODUCT DESIGNATION

Mercuric Nitrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.08 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Skin, ingestion inhalation

SKIN AND EYE

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Excessive salivation, pain on chewing followed by tremors, extreme timidity, inflammation of mucous membranes and eyes.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage, dermatitis, loosening of teeth.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give teaspoon of salt in glass of warm water, to induce vomiting, then milk or egg white, get medical aid, wash from skin with soap and water; inhalation - rest, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

Acetylene, ethyl alcohol, phosphene, sulfur, unsaturated aromatics.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-091-8006 Mercurous 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 Mercurous Nitrate	FORMULA $\text{Hg}_2(\text{NO}_3)_2 \cdot 2\text{H}_2\text{O}$

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES CONC.
#1 LD ₅₀ intraperitoneal	- mouse 4 mg/kg.		See Note 1		

SECTION III PHYSICAL DATA MW 561.22	
BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 70° C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 4.79	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Crystalline, colorless	

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

EXTINGUISHING MEDIA Water - best

SPECIAL FIRE FIGHTING PROCEDURES Water in form of fine droplets or spray.
--

UNUSUAL FIRE AND EXPLOSION HAZARDS Strong oxidizing agent - moderate fire hazard by chemical reaction with reducing agents.
--

PRODUCT DESIGNATION

Mercurous Nitrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 0.07 mg/m³

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Ingestion, absorption through the skin, inhalation IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Excessive salivation, gingivitis, with loosening of teeth, tremors, stomatitis and psychic disturbances.

EFFECTS OF CHRONIC EXPOSURE Tremor and psychic disturbances, liver and kidney damage, loosening of teeth.

EMERGENCY AND FIRST AID PROCEDURES If conscious, give teaspoon salt in warm water to induce vomiting, then milk or egg white in water; remove from skin by soap and water washing.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Avoid contact mercurous nitrate 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
Safety glasses or goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
W/appropriate filter

OTHER PROTECTIVE EQUIPMENT

Rubber apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-305-2701
Mesitylene

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

1,3,5 Trimethylbenzene

 $(CH_3)_3C_6H_3$

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 intraperitoneal - rat	1500 mg/kg					

SECTION III PHYSICAL DATA

MW = 120.19

BOILING POINT 165°C	° F.	VAPOR PRESSURE at 20°C	mm Hg.
			1.86
MELTING POINT -53°C	° F.	VAPOR DENSITY (Air = 1)	
		1.01	
SPECIFIC GRAVITY (H ₂ O = 1) 0.86		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR liquid, peculiar odor			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 122°F	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

Mesitylene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

25 PPM

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

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

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

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

03-305-2601
Mesityl oxide

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 Isopropylideneacetone		FORMULA (CH ₃) ₂ CCHCOCH 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 Notes			
Note #1:						
Intraperitoneal - mouse LD 50 354 mg/kg						
Note #2:						
Lowest published lethal concentration in air						
inhalation - rat 1000 PPM						

SECTION III PHYSICAL DATA

BOILING POINT 130°C	° F.	VAPOR PRESSURE at 26°C	MW 98.14	10 mm Hg.
MELTING POINT -59°C	° F.	VAPOR DENSITY (Air = 1) 3.38		
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 oily liquid, honeylike odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

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

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Mesityl oxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 25 PPM, 100 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE Dermatitis, corneal injury, respiratory irritation,
lowering of respiratory and heart rate, loss of reflexes, coma.

EFFECTS OF CHRONIC EXPOSURE

Kidney, liver and lung damage.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - 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)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 well ventilated area. Isolate from oxidizing materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-305-5631
03-305-5671
Methyl 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 Methyl Acetic Ester		FORMULA CH ₃ COOCH 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						
subcutaneous - guinea pig, 3000 mg/kg						
oral - rat 4800 mg/kg						
lowest published lethal concentration in air						
inhalation - mouse 80 mg/C.M.						
inhalation - cat 67 mg/C.M.						

SECTION III PHYSICAL DATA

BOILING POINT 58°C	° F.	VAPOR PRESSURE at 9°C	mm Hg. 100
MELTING POINT -99°C	° F.	VAPOR DENSITY (Air = 1)	2.55
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.92			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
33			

APPEARANCE AND ODOR

colorless liquid, fruity odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 15°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 16%
METHOD USED C.C.		LOWER 3.1%

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Methyl acetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

200 PPM, 610 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation, skin

SKIN AND EYE

IRRITATION

severe

REVELANT SYMPTOMS OF EXPOSURE

Irritation of eyes and upper respiratory system, dizziness and depression, palpitation of heart.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid;
inhalation - rest; wash 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

Neoprene

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

03-305-6101
Methyl Acrylate

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

Methyl Acrylate

CH₂ = C(CH₃)COOCH₃

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.
			300		rat	
				1300	rabbit	

SECTION III PHYSICAL DATA MW - 86.1

BOILING POINT 80°C	° F.	VAPOR PRESSURE at 28°C	mm Hg. 100
MELTING POINT -75°C	° F.	VAPOR DENSITY (Air = 1)	2.97
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.95			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless liquid, acrid odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 27°C	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER

EXTINGUISHING MEDIA

Carbon dioxide, dry chemical, foam.

SPECIAL FIRE FIGHTING PROCEDURES

Water spray may be ineffective. Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Heat may cause polymerization and rapid expansion.

PRODUCT DESIGNATION

Methyl Acrylate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

10 PPM, 35 mg/C.M. (Skin)

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

Severe

RELEVANT SYMPTOMS OF EXPOSURE

Eyes, nose & throat irritation, headache, skin eruptions.

EFFECTS OF CHRONIC EXPOSURE

Lung, liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic; get medical aid;
inhalation - artificial respiration and oxygen as needed. Wash from skin
& eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

Heat

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

Neoprene 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
03-208-6502
03-208-6552
03-208-6002
03-208-6052 Methyl 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

Wood alcohol

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Methanol

FORMULA

CH₃OH

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
				4100	Mouse	
			See Note			
Note:						
Lowest published toxic concentration in air						
inhalation - human 300 PPM						
lowest published toxic dose						
oral - human - 340 Mg/Kg.						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	100 mm Hg.
65°C		at 21°C	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-98°C		1.11	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.79			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
Infinitely soluble			
APPEARANCE AND ODOR			
Colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 52° F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 36
METHOD USED		LOWER 7.3

EXTINGUISHING MEDIA

Alcohol foam, dry chemical, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Methyl Alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 200 PPM, 260 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion, skin

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE Disturbs vision, dizziness, stupor, cyanosis, abdominal cramps.

EFFECTS OF CHRONIC EXPOSURE Irritation of mucous membranes, headache, tremors, neuritis, vision failure.

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)

Perchloric acid, Sodium hydroxide and chloroform

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

03-305-9601
Methyl N-Amyl Ketone

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 Heptanone	FORMULA $\text{CH}_3(\text{CH}_2)_4\text{COCH}_3$

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.
			1670	*	rat	
				See Note		
Lowest published lethal concentration in air inhalation - rat 4000 PPM						

SECTION III PHYSICAL DATA MW - 114.18

BOILING POINT 151°C	° F.	VAPOR PRESSURE at 20°C	mm Hg.
MELTING POINT -36°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.4		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Water white liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 120°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

PRODUCT DESIGNATION

Methyl N-Amyl Ketone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

100 PPM, 465 mg/kg.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

Irritation of mucous membranes, narcosis, eye irritation.

EFFECTS OF CHRONIC EXPOSURE

--

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

SPECIAL

Neoprene
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>03-306-0202 N-Methylaniline</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 Monomethylaniline	FORMULA <chem>Cc1ccccc1N</chem>

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
Note:			See Note		
Lowest published lethal dose					
oral - rabbit - 280 mg/kg					
oral - mouse 380 mg/kg					

SECTION III PHYSICAL DATA	
BOILING POINT 196°C	VAPOR PRESSURE at 36°C
MELTING POINT -57°C	VAPOR DENSITY (Air = 1) 3.70
SPECIFIC GRAVITY (H ₂ O = 1) 0.99	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Reddish brown, oily 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 hen heated to decomposition, emits aniline fumes.

PRODUCT DESIGNATION

N-Methylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

2 PPM, 9 mg/C.M.

CARCINOGENIC

neoplastic

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation, 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, blood damage, central nervous system 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

Neoprene 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>03-306-2702 Methyl Bromoacetate</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 Methyl Bromoacetate	FORMULA <chem>CH3COOCH2Br</chem>

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
Note:			See Note		
Lowest published lethal dose					
intravenous - mouse	10 mg/kg				

SECTION III PHYSICAL DATA				MW - 152.99	
BOILING POINT	° F.	VAPOR PRESSURE		mm Hg.	
144 d		52 °C		15	
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)			
> 1					
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol.	% Wt.	
low solubility					
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 and water.

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Methyl Bromoacetate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

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

EFFECTS OF CHRONIC EXPOSURE

--

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

Store in standard flammable liquids cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-306-3702
Methyl 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 Methyl 3-Bromopropionate	FORMULA $\text{BrCH}_2\text{CH}_2\text{COOCH}_3$

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 - 167.01

BOILING POINT at 60 mm - 106°C	° F.	VAPOR PRESSURE at 60°C	mm Hg.
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)	12
SPECIFIC GRAVITY (H ₂ O = 1) 1.5122		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 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		

PRODUCT DESIGNATION	
Methyl B-Bromopropionate	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
none available	no
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE
inhalation, ingestion, skin	IRRITATION
	severe
RELEVANT SYMPTOMS OF EXPOSURE Irritation of eyes and upper respiratory system, dizziness and depression, palpitation of heart.	
EFFECTS OF CHRONIC EXPOSURE	

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give emetic, get medical aid; inhalation - rest; wash 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	
Store in standard flammable liquids cabinet.	
OTHER PRECAUTIONS	
SIGNATURE	DATE

PRODUCT DESIGNATION

03-306-6202
Methyl 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 dimethyl carbonate	FORMULA CO(OCH 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 - 90.08

BOILING POINT 90°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 1°C	° F.	VAPOR DENSITY (Air = 1)	3.1
SPECIFIC GRAVITY (H ₂ O = 1) 1.07		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, pleasant odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 66°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		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

PRODUCT DESIGNATION
Methyl Carbonate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL none available CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION inhalation (mainly), ingestion SKIN AND EYE IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE Weakness, loss of coordination, gasping, frothing at mouth, pulmonary edema.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES If swallowed - drink water, milk of magnesia, get medical aid; inhalation - artificial respiration & oxygen as needed - 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 Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside storage preferred, store inside flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-307-0303 P-Methylcyclohexanol

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 Hexahydromethyl Phenol	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Hexahydrocresol	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{OH}$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			See Note			
Lowest published lethal dose						
oral - rabbit 1750 mg/kg						

SECTION III PHYSICAL DATA		MW - 114.18
BOILING POINT 174°C	° F.	VAPOR PRESSURE at 30°C
MELTING POINT -50°C	° F.	VAPOR DENSITY (Air = 1) 3.93
SPECIFIC GRAVITY (H ₂ O = 1) 0.92		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless, viscous liquid, aromatic, menthol odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 154°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER

EXTINGUISHING MEDIA Foam, carbon dioxide or dry chemicals.
SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Methylcyclohexanol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

50 PPM, 235 mg/C.M.

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

REVELANT SYMPTOMS OF EXPOSURE Salivation, eye and mucous membrane irritation, tremors,
nausea, headache, gross hemorrhage.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage

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

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

03-307-0703
M-Methylcyclohexanone

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 Methylcyclohexanone

FORMULA

CH₃C₆H₁₁CO

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 170°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -74°C	° F.	VAPOR DENSITY (Air = 1) 3.86
SPECIFIC GRAVITY (H ₂ O = 1) 0.92		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O no		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR

water white to pale yellow, acetone like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 118°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

M-Methylcyclohexanone

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, skin and mucous membrane irritation, narcosis

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid, gastric lavage; inhalation - give oxygen as needed. 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 03-307-0903 P-Methylcyclohexanone
--

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 Methylcyclohexanone	FORMULA <chem>CH3C5H9CO</chem>

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

SECTION III PHYSICAL DATA	
BOILING POINT 171°C	VAPOR PRESSURE mm Hg.
MELTING POINT -41°C	VAPOR DENSITY (Air = 1) 3.86
SPECIFIC GRAVITY (H ₂ O = 1) 0.93	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O no	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR water white to pale yellow - acetone like odor.	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 118°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

P-Methylcyclohexanone

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, skin and mucous membrane irritation, narcosis.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid, gastric lavage;
Inhalation - give oxygen as needed. 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

03-307-1303
Methyl A, B-Dibromopropionate

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 Methyl 2,3 - Dibromopropionate	FORMULA $\text{BrCH}_2\text{CHBrCOOCH}_3$

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 - 245.92

BOILING POINT 203 at 115 mm	° F.	VAPOR PRESSURE at 93°C	mm Hg. 17
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.96		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR clear liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

PRODUCT DESIGNATION
Methyl A,B-Dibromopropionate

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 Irritation of eyes and upper respiratory system,
dizziness and depression, palpitation of heart.

EFFECTS OF CHRONIC EXPOSURE
--

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give emetic, get medical aid;
inhalation - rest; wash 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
MECHANICAL (GENERAL)	goggles
	GLOVES
SPECIAL	rubber
OTHER PROTECTIVE EQUIPMENT	RESPIRATOR with proper filter

SECTION IX SPECIAL PRECAUTIONS

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

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-307-2103
Methylene 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

Dibromomethane

FORMULA

 CH_2Br_2

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
				3738	mouse	

SECTION III PHYSICAL DATA MW - 173.86

BOILING POINT 97°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -52.7°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.50		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 1.17		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

Probably inflammable like CH_2Cl_2

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Methylene Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	not available	CARCINOGENIC	no
PRINCIPLE ROUTES OF ABSORPTION	inhalation, skin, ingestion	SKIN AND EYE IRRITATION	moderate
RELEVANT SYMPTOMS OF EXPOSURE	Dizziness, nausea, numbness of extremities, sense of stupor or dullness, drunkenness.		
EFFECTS OF CHRONIC EXPOSURE	Dermatitis		
EMERGENCY AND FIRST AID PROCEDURES	Inhalation - rest; if swallowed - induce vomiting, 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
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

03-307-2203
03-307-2253
Methylene 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 Dichloromethane	FORMULA CH_2Cl_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			
Lowest published toxic concentration in air						
inhalation - human 500 PPM/1 year						
Lowest published lethal dose						
Oral - dog - 3000 mg/kg						
intravenous - dog - 200 mg/kg						
subcutaneous - rabbit - 2700 mg/kg						

SECTION III PHYSICAL DATA MW - 84.94

BOILING POINT 40°C	° F.	VAPOR PRESSURE at 22°C	380 mm Hg.
MELTING POINT -97°C	° F.	VAPOR DENSITY (Air = 1) 2.93	
SPECIFIC GRAVITY (H ₂ O = 1) 1.33		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 2		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR colorless, volatile liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 66%
METHOD USED practically non-inflammable		LOWER 15.5%
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Methylene chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL 100 PPM, 360 mg/C.M. CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION inhalation, ingestion, skin SKIN AND EYE IRRITATION severe

REVELANT SYMPTOMS OF EXPOSURE Headache, giddiness, stupor, irritability, fatigue, irritation of eyes and respiratory passages.

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

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)	safety goggles
SPECIAL	GLOVES
	rubber
OTHER PROTECTIVE EQUIPMENT	RESPIRATOR
	self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-307-2303
Methylene 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

FORMULA

diiodomethane

CH₂I₂

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.
				830	mouse	

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
181°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
5°C		9.25	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
3.33			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
1.6			

APPEARANCE AND ODOR

light straw to clear colored liquid.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

not available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition point - emits toxic fumes of iodides.

PRODUCT DESIGNATION
Methylene iodide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	not available	CARCINOGENIC	no
PRINCIPLE ROUTES OF ABSORPTION	inhalation, ingestion, skin	SKIN AND EYE IRRITATION	moderate
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 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
	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

03-307-2803
Methylethylamine
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

N-Methylethylamine Hydrochloride

FORMULA

CH₃NHC₂H₅Cl

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 = 95.58

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 133°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 white 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

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Methylethylamine 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

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 - 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

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-307-3303
Methylethylaniline

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

Methylethylaniline

FORMULA

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

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 - 135.20

BOILING POINT 201°C	° F.	VAPOR PRESSURE at 94°C	mm Hg.
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)	12
SPECIFIC GRAVITY (H ₂ O = 1) 0.92		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR colorless to yellow liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	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
Methylethylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
~~none available~~
PRINCIPLE ROUTES OF ABSORPTION ~~none available~~
inhalation, ingestion, skin
SKIN AND EYE
IRRITATION severe
CARCINOGENIC no
REVELANT 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 If swallowed - give emetic, get medical aid; inhalation - rest; wash from skin & eyes.

SECTION VI REACTIVITY DATA

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

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

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

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
OTHER PRECAUTIONS
SIGNATURE
DATE

PRODUCT DESIGNATION 03-307-3843 03-307-3853 Methyl Ethyl Ketone

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 Butanone	FORMULA $\text{CH}_3\text{COC}_2\text{H}_5$

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.
			3100		rat	
			see note			
Note:						
Lowest published lethal concentrations in air						
inhalation - rat 2000 PPM						

SECTION III PHYSICAL DATA		MW - 72.10
BOILING POINT 80°C	° F.	VAPOR PRESSURE at 20°C mm Hg. 71.2
MELTING POINT -86°C	° F.	VAPOR DENSITY (Air = 1) 2.41
SPECIFIC GRAVITY (H ₂ O = 1) 0.81		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 37		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, acetone-like odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 22°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER
EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical. Water may be ineffective.		

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS Moderate explosion hazard when exposed to flame.

PRODUCT DESIGNATION

Methyl Ethyl Ketone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

200 PPM, 590 mg/C.M.

CARCINOGENIC

severe

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion

IRRITATION

severe

RELEVANT SYMPTOMS OF EXPOSURE

Eye and nasal passage irritation, narcotic symptoms, drying & irritation of skin.

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

Store in standard safety cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-307-5803 Methylhydrazine Sulfate
--

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 Methylhydrazine Sulfate	FORMULA $CH_3NHNH_2 \cdot H_2SO_4$

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	
BOILING POINT -- ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 142°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 white crystal	

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
Methylhydrazine Sulfate

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

REVELANT SYMPTOMS OF EXPOSURE Respiratory irritation and convulsions, eye and skin irritations, gastroentric disturbances.

EFFECTS OF CHRONIC EXPOSURE

Blood and liver damage.

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-307-7803
Methyl 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 Iodomethane	FORMULA CH_3I

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.
				110	mouse	
			50		rat	

SECTION III PHYSICAL DATA MW - 141.95

BOILING POINT 42.5°C	° F.	VAPOR PRESSURE at 25.3°C	mm Hg.
MELTING POINT -64.4°C	° F.	VAPOR DENSITY (Air = 1) 4.89	
SPECIFIC GRAVITY (H ₂ O = 1) 2.28		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 1.8		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR Colorless liquid - turns brown on exposure to light sweetish smell.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

not available

SPECIAL FIRE FIGHTING PROCEDURES

--

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition point - emits toxic fumes of iodides.

PRODUCT DESIGNATION

Methyl Iodide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5 PPM, 28 mg/CM.

CARCINOGENIC yes

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

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

EFFECTS OF CHRONIC EXPOSURE

Dermatitis

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

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>03-306-4702 Methyl Iso-Butyl Ketone</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
<u>4-Methyl-2-Pentanone</u> CHEMICAL NAME AND SYNONYMS Hexone	FORMULA $\text{CH}_3\text{-COCH}_2\text{CH}(\text{CH}_3)_2$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			2080		rat	
				see note		
Note:						
Lowest published toxic concentration in air						
inhalation - human 200 PPM						

SECTION III PHYSICAL DATA		MW - 100.16	
BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
118°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-85°C		3.45	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.80			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
2			

APPEARANCE AND ODOR

Colorless liquid, pleasant ketone like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
62°F		
METHOD USED		LOWER
C.C.		

EXTINGUISHING MEDIA

Foam, carbon dioxide, dry chemical. Water may be ineffective.

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles & self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Methyl Iso-butyl Ketone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

100 PPM, 410 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

moderate

REVELANT SYMPTOMS OF EXPOSURE

Eye and nasal irritation, narcosis, headache, nausea, lowering of body temperature

EFFECTS OF CHRONIC EXPOSURE

--

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

MECHANICAL (GENERAL)

GLOVES

SPECIAL

Rubber
RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside storage preferable, inside storage in a standard flammable liquid cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-308-8404 Methyl-Iso-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 2 Methyl butanol 3	FORMULA (CH ₃) ₂ CHCHOHCH 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 112°C	VAPOR PRESSURE mm Hg.
MELTING POINT	VAPOR DENSITY (Air = 1) 3.0
SPECIFIC GRAVITY (H ₂ O = 1) 0.82	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 2.8	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless to yellow liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 103°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 9.0%
METHOD USED		LOWER 1.2%

EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical.
--

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Methyl - Iso - Propylcarbinol

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, nose and throat irritation, narcosis; headache, dizziness, nausea, vomiting, diarrhea.

EFFECTS OF CHRONIC EXPOSURE Liver damage

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

03-308-8904
Methyl Iso-Propyl Ketone

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 Methyl 2 Butanone	FORMULA $\text{CH}_3\text{COCH}(\text{CH}_3)_2$

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.
			148		rat	
				see note		
Note: Lowest published lethal concentration in air inhalation rat 5700 PPM/4 hr.						

SECTION III PHYSICAL DATA MW - 86.13

BOILING POINT 95°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -92°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 0.80		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, acetone like odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Methyl Isopropyl Ketone

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 to eyes and mucous membranes, narcotic effect.

EFFECTS OF CHRONIC EXPOSURE

--

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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

03-309-2205
Methyl-Iso-Thiocyanate

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 Methyl Mustard Oil	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Methyl Isothiocyanate	FORMULA CH ₃ CnS

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.
			305		rat	

SECTION III PHYSICAL DATA MW - 73.11

BOILING POINT 119°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 36°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.07		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
METHOD USED		LOWER

EXTINGUISHING MEDIA
Water, alcohol foam, carbon dioxide, dry chemical.

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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Methyl - Iso - Thiocyanate

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 mucous membrane irritation, skin irritation.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give emetic, medical aid, gastric lavage;
inhalation - rest, give oxygen as needed; 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

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-308-0404

A- Methylnaphthalene

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 Methylnaphthalene

FORMULA

 $C_{10}H_7CH_3$

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.
			4360		rat	

SECTION III PHYSICAL DATA MW - 142.21

BOILING POINT 243°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -32°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.03		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

Self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

A-Methylnaphthalene

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, diarrhea, anemia, jaundice, excitement,
convulsions, coma, headache, visual disturbances.

EFFECTS OF CHRONIC EXPOSURE

Nausea, vomiting, diarrhea, anemia, jaundice, dermatitis.

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

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>03-308-0474 B-Methylnaphthalene</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 Methylnaphthalene	FORMULA $C_{10}H_7CH_3$

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.
			4360		rat	

SECTION III PHYSICAL DATA		MW - 142.21	
BOILING POINT 242°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 34°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.944		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR solid			

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

B-Methylnaphthalene

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, diarrhea, anemia, jaundice, excitement,
convulsions, coma, headache, visual disturbances.

EFFECTS OF CHRONIC EXPOSURE

Nausea, vomiting, diarrhea, anemia, jaundice, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES

Ingestion - 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

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>03-308-4904 4 Methyl - 2 Pentanol</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 Methylamyl alcohol	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Methy isobutyl carbinol	FORMULA <chem>CH3CHOHCH2CH(CH3)2</chem>

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.
			2600		rat	
				3560	rabbit	
			see note			
Note: Lowest published lethal concentration in air inhalation - rat - 2000 PPM 14 hours						

SECTION III PHYSICAL DATA MW - 102.2			
BOILING POINT 132°C	° F.	VAPOR PRESSURE at 20°C	mm Hg. 2.8
MELTING POINT -90°C	° F.	VAPOR DENSITY (Air = 1)	3.53
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.81			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
1.6			
APPEARANCE AND ODOR clear liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 106°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 5.5%
METHOD USED		LOWER 1.0%

EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
4 Methyl 2 Pentanol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL 25 PPM, 100 mg/C.M. (skin) CARCINOGENIC no

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

REVELANT SYMPTOMS OF EXPOSURE
Eye irritation, narcotic in high concentrations.

EFFECTS OF CHRONIC EXPOSURE
--

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
MCCIIANICAL (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

03-308-5904
Methyl-P-Phenylenediamine
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

N Methyl - P - Phenylenediamine Hydrochloride

FORMULA

$\text{CH}_3\text{NHC}_6\text{H}_4\text{NH}_2\text{HCl}$

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 - 195.10

BOILING POINT --	° 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 very soluble		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	
Methyl-P-Phenylenediamine Dihydrochloride	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	<div style="display: flex; justify-content: space-between;"> none available CARCINOGENIC _{no} </div>
PRINCIPLE ROUTES OF ABSORPTION	<div style="display: flex; justify-content: space-between;"> Inhalation of dust, ingestion SKIN AND EYE IRRITATION moderate </div>
RELEVANT SYMPTOMS OF EXPOSURE	Headache, drowsiness, cyanosis, mental confusion, convulsions.
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

03-308-6404

A-Methyl-A-Phenylhydrazine

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 Methyl, 1 Phenylhydrazine

FORMULA

 $\text{NH}_2\text{N}(\text{C}_6\text{H}_5)\text{CH}_3$
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 - 122.17

BOILING POINT

227°C at 755 mm

°F.

VAPOR PRESSURE

at 118°C

mm Hg.

21

MELTING POINT

°F.

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O = 1)

1.04

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

slightly soluble

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

yellow liquid

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

alcohol foam, water, carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition point, it gives off fumes of nitrogen compounds.

PRODUCT DESIGNATION

A-Methyl-A-Phenylhydrazine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE Irritation of skin, eyes and mucous membranes,
gastroenteric disturbances.

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

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

CA - 000556649

PRODUCT DESIGNATION

03-309-2105
Methyl ThiocyanateMATERIAL SAFETY
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

Methyl Sulfocyanate

FORMULA

CH₃SCN

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. Lowest published lethal dose						
oral - cat 8.5 mg/kg						
2. Subcutaneous - rat	LD20 - 29 mg/kg					

SECTION III PHYSICAL DATA

MW - 73.11

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

133°C

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

-51°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (____ = 1)

1.07

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

very slightly soluble

APPEARANCE AND ODOR

colorless liquid, onion odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

water, alcohol foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus and goggles.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Methyl Thiocyanate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

ingestion, inhalation

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE

eye and mucous membrane irritation. Thiocyanate intoxication.

EFFECTS OF CHRONIC EXPOSURE

Goiters

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid, gastric lavage; inhalation - rest, give oxygen as needed. 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

<p align="center">PRODUCT DESIGNATION</p> <p>03-309-3605 Methyl-M-Toluidine</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 N Methyl-M-Toluidine	FORMULA <chem>CN(C)Cc1ccc(C)cc1</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 207°C ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -- ° 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	
Methyl-M-Toluidine	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
none available	no
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE
Inhalation, ingestion, skin	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	
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 liquids storage cabinet.	
OTHER PRECAUTIONS	
SIGNATURE	DATE

PRODUCT DESIGNATION 03-309-3705 Methyl-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 Methyl-O-Toluidine	FORMULA $\text{CH}_3\text{NHC}_6\text{H}_4\text{CH}_3$

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 207°C	VAPOR PRESSURE mm Hg.
MELTING POINT --	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 0.97	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

Methyl-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

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

03-309-3805
Methyl 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 Methyl P Toluidine

FORMULA

$$\text{CH}_3\text{NHC}_6\text{H}_4\text{CH}_3$$

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 MW - 121.18

BOILING POINT 210°C	° F.	VAPOR PRESSURE	mm Hg.
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

Methyl-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, high 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 liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION
03-309-8205 03-309-8305 Morpholine

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>Diethylenimide oxide</u>	
CHEMICAL NAME AND SYNONYMS	FORMULA
<u>Morpholine</u>	<u>C₂H₄OC₂H₄NH</u>

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1050	500	rat rabbit	

SECTION III PHYSICAL DATA		MW - 87.12
BOILING POINT 129°C	° F.	VAPOR PRESSURE at 23°C mm Hg. 10
MELTING POINT -8°C	° F.	VAPOR DENSITY (Air = 1) 3.00
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, hygroscopic oil, pepper-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 100°F	FLAMMABLE (EXPLOSIVE)	UPPER
METHOD USED O.C.	LIMITS	LOWER

EXTINGUISHING MEDIA
Alcohol foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Morpholine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
20 PPM, 70 mg/C.M. skin

CARCINOGENIC neoplastic

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE
IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE
Nasal & bronchial irritation, skin and eye irritation.

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - get medical aid immediately - gastric lavage with milk; inhalation - rest - artificial respiration, 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 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 03-309-9205 Myristoyl 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
Myristoyl Chloride	$C_{13}H_{27}Cl$

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 168°C 15 mm	VAPOR PRESSURE mm Hg.
MELTING POINT 3°C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O decomposes in water	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 Carbon dioxide, dry chemical. Do not use water.

SPECIAL FIRE FIGHTING PROCEDURES
Full protective clothing, self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
When heated to decomposition point, gives off toxic HCl.

PRODUCT DESIGNATION
Myristoyl 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 and skin burns.

EFFECTS OF CHRONIC EXPOSURE
Bronchial irritation, errosion of teeth.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
Reacts with water or alcohol

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 vapor.

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

03-314-0706
Naphthalene

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

moth flakes

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

naphthalene

FORMULA

 $C_{10}H_8$ SECTION II HAZARDOUS INGREDIENTS 10^{-8}

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1780		rat	

SECTION III PHYSICAL DATA MW - 128.16

BOILING POINT 218°C	° F.	VAPOR PRESSURE at 52.6°C	mm Hg.
MELTING POINT 80.2°C	° F.	VAPOR DENSITY (Air = 1)	1
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.145			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
low			

APPEARANCE AND ODOR

white crystalline solid - moth ball odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 174°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		5.9%
		LOWER
		0.9%

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Naphthalene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

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

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE

IRRITATION yes

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

EFFECTS OF CHRONIC EXPOSURE

clouding of lens.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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

03-314-6306
A-Naphthylhydrazine
Hydrochloride

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

α Naphthylhydrazine hydrochloride

FORMULA

$$\text{C}_{10}\text{H}_7\text{NHNH}_2\text{HCl}$$

SECTION II HAZARDOUS INGREDIENTS

[illegible]

SECTION III PHYSICAL DATA MW - 194.66

BOILING POINT

— 222 —

⁰ F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

—

0 F.

VAPOR DENSITY (Air = 1)	2.2
-------------------------	-----

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (= 1)

SOLUBILITY IN WATER		Pts/100 pts H ₂ O
at 20°C	soluble	100
at 30°C	soluble	100
at 40°C	soluble	100
at 50°C	soluble	100
at 60°C	soluble	100
at 70°C	soluble	100
at 80°C	soluble	100
at 90°C	soluble	100
at 100°C	soluble	100

VOLATILE

	% Vol.
100	100
90	90
80	80
70	70
60	60
50	50
40	40
30	30
20	20
10	10
0	0

% Wt.

soluble

APPEARANCE AND ODOR

crystalline

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

METHOD USED

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

A-Naphthylhydrazine 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

REVELANT SYMPTOMS OF EXPOSURE Irritation of skin, eyes and mucous membranes - gastroentric 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

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

<p align="center">PRODUCT DESIGNATION</p> <p>03-314-1206 A-Naphthaleneacetonitrile</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
1 Naphthaleneacetonitrile	
CHEMICAL NAME AND SYNONYMS	FORMULA
α naphthaleneacetonitrile	$C_{10}H_7CH_2CN$

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 194°C at 18 mm	VAPOR PRESSURE 185°C
MELTING POINT 35°C	VAPOR DENSITY (Air = 1) 10
SPECIFIC GRAVITY (H ₂ O = 1) --	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O --	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR crystal or 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
A-Naphthaleneacetonitrile

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
~~none available~~

SKIN AND EYE

inhalation, ingestion (mainly)

IRRITATION moderate

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

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

EMERGENCY AND FIRST AID PROCEDURES If swallowed - cyanide antidote; inhalation - inhale amyl nitrite artificial respiration; 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

03-314-6806
1-Naphthyl Isocyanate

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- Naphthyl Isocyanate	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 1 - Naphthyl Isocyanate	FORMULA $C_{10}H_7NCO$

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.
			245		mouse	

SECTION III PHYSICAL DATA

MW - 169.17

BOILING POINT 270°C	°F.	VAPOR PRESSURE mm Hg.
MELTING POINT 4°C	°F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.18		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 LOWER
METHOD USED		

EXTINGUISHING MEDIA
alcohol foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

1 - Naphthyl Isocyanate

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

skin, eye and respiratory tract irritation.

EFFECTS OF CHRONIC EXPOSURE

allergic sensitization of respiratory tract.

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

03-314-6906
B-Naphthyl Isocyanate

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-Naphthyl Isocyanate	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS B-Naphthyl Isocyanate	FORMULA $C_{10}H_7NCO$

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 - 169.17

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 56°C	° F.	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 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

B-Naphthyl Isocyanate

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

Skin, eye and respiratory tract irritation.

EFFECTS OF CHRONIC EXPOSURE

Sensitization of respiratory tract.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

goggles

MECHANICAL (GENERAL)

GLOVES

rubber

SPECIAL

RESPIRATOR

with proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-097-2848 Nickel 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 Nickel				FORMULA Ni		
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			
Lowest published toxic concentration in air						
Inhalation - guinea pig 15 mg/kg.						
Lowest published lethal dose						
Oral - guinea pig 5 mg/kg.						
SECTION III PHYSICAL DATA 58.71						
BOILING POINT 2835°C.		° F.	VAPOR PRESSURE mm Hg.			
MELTING POINT 1445°C.		° F.	VAPOR DENSITY (Air = 1)			
SPECIFIC GRAVITY (H ₂ O = 1) 8.9			EVAPORATION RATE (_____ = 1)			
SOLUBILITY IN WATER Pts/100 pts H ₂ O 1			VOLATILE % Vol.		% Wt.	
APPEARANCE AND ODOR Silver colored metal.						
SECTION IV FIRE AND EXPLOSION HAZARD DATA						
FLASH POINT N/A			FLAMMABLE (EXPLOSIVE) LIMITS		UPPER	
METHOD USED N/A					LOWER	
EXTINGUISHING MEDIA N/A						
SPECIAL FIRE FIGHTING PROCEDURES						
UNUSUAL FIRE AND EXPLOSION HAZARDS Powder may burn.						

PRODUCT DESIGNATION

Nickel Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 1 mg/m³

CARCINOGENIC yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation (mainly) ingestion

SKIN AND EYE

IRRITATION slight

RELEVANT SYMPTOMS OF EXPOSURE

Nausea, vomiting, diarrhea, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE

Cancer of the lungs, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Vigorous reaction of Ni powder with S or Se.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 appropriate filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-097-3508 Nickelous Ammonium Sulfate

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 Nickelous Ammonium Sulfate	FORMULA $(\text{NH}_4)_2\text{Ni}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$

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

SECTION III PHYSICAL DATA		395.02
BOILING POINT N/A	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT N/A	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.923		EVAPORATION RATE (_____ = 1) •
SOLUBILITY IN WATER Pts/100 pts H ₂ O 2.5 at 3.5°C.		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Blue-green crystals.		

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

PRODUCT DESIGNATION
Nickelous Ammonium Sulfate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 0.66 + mg/m³ CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust (mainly) ingestion SKIN AND EYE
IRRITATION Slight

RELEVANT SYMPTOMS OF EXPOSURE
Giddiness, nausea and vomiting.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - wash mouth, give emetic, get medical attention
if inhaled - rest, get medical attention, wash from eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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>03-097-4908 Nickelous Chloride</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 Nickel chloride	FORMULA $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See note			
Note: Lowest published lethal dose intravenous - dog	10 mg/kg.					

SECTION III PHYSICAL DATA	
BOILING POINT -- ° F.	237.72 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 180	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR green 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
Nickelous chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.49 mg/m ³	CARCINOGENIC no
PRINCIPLE ROUTES OF ABSORPTION Inhalation of dust (mainly) ingestion	SKIN AND EYE IRRITATION Slight
REVELANT SYMPTOMS OF EXPOSURE Giddiness, nausea, vomiting	
EFFECTS OF CHRONIC EXPOSURE Dermatitis	
EMERGENCY AND FIRST AID PROCEDURES If inhaled - rest, get medical attention. If swallowed - wash mouth, give emetic, get medical attention, wash from skin and eyes.	

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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 Face shield
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 03-097-6958 03-097-7008 Nickelous 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 Nickelous Nitrate	FORMULA $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$

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.
			1620		rat	

SECTION III PHYSICAL DATA 290.82	
BOILING POINT 136.7°C.	VAPOR PRESSURE mm Hg.
MELTING POINT 56.7°C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.05	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 243 at 0°C.	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Green crystals	

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

EXTINGUISHING MEDIA Flood with water

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

UNUSUAL FIRE AND EXPLOSION HAZARDS Oxidizing material.

PRODUCT DESIGNATION
Nickelous nitrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 0.49 l mg/m³ CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation (mainly) ingestion SKIN AND EYE
IRRITATION slight

REVELANT SYMPTOMS OF EXPOSURE
Giddiness, nausea and vomiting.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis.

EMERGENCY AND FIRST AID PROCEDURES If inhaled - rest. If swallowed, wash mouth, give emetic,
get medical attention, wash from eyes and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
Explosion hazard with aluminum powder and organic 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 Face shield
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 03-097-8508 Nickelous Sulfate
--

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 Nickelous Sulfate	FORMULA Ni(SO ₄)

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
			See Note		
Note: Intraperitoneal -	mouse LD ₅₀ 21 mg/kg				

SECTION III PHYSICAL DATA		MW - 280.89
BOILING POINT -6H ₂ O, 103°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 98-100°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.984		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 63.5		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Green crystals		

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

EXTINGUISHING MEDIA Water

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

PRODUCT DESIGNATION
Nickelous Sulfate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 0.48 mg/m³ CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust (mainly) ingestion SKIN AND EYE
IRRITATION Slight

RELEVANT SYMPTOMS OF EXPOSURE
Giddiness, nausea, vomiting

EFFECTS OF CHRONIC EXPOSURE
Dermatitis

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Face shield
--	---

MECHANICAL (GENERAL)	GLOVES
----------------------	--------

SPECIAL	RESPIRATOR
---------	------------

OTHER PROTECTIVE EQUIPMENT	With appropriate filter
----------------------------	-------------------------

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-001-2933
Nitric AcidMATERIAL SAFETY
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
Nitric AcidFORMULA
 HNO_3

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀ PPM	
			ORAL	PERCUT.	SPECIES	CONC.
					Rat	49

SECTION III PHYSICAL DATA MW 63.02

BOILING POINT 86°C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -42°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 ∞		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Transparent, colorless to yellow or red fuming - suffocation.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water spray

SPECIAL FIRE FIGHTING PROCEDURES

Use water spray, wear full-protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Reacts explosively with metallic powders, carbides, hydrogen sulfide and turpentine.

PRODUCT DESIGNATION

Nitric Acid

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 2 PPM, 5 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of fumes, attack on skin, ingestion

SKIN AND EYE

IRRITATION Yes

RELEVANT SYMPTOMS OF EXPOSURE Respiratory difficulty, feeling of oppression in chest, dyspnea, cyanosis, and syncope.

EFFECTS OF CHRONIC EXPOSURE

Yellowing of skin and erosion of teeth.

EMERGENCY AND FIRST AID PROCEDURES For ingestion - gastric lavage with water and emollients, obtain medical attention; wash skin and eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Acetic, Chromic and Hydrocyanic acids, Aniline, Carbon, Hydrogen Sulfide, flammable media, fluids or gases and substances which are readily

HAZARDOUS DECOMPOSITION PRODUCTS nitrated.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 appropriate filter.

OTHER PROTECTIVE EQUIPMENT

Face shield, rubber apron.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Separate from metallic powders, carbides, hydrogen sulfide, turpentine, organic acids, and all combustible, organic or other readily oxidizable materials.

OTHER PRECAUTIONS

Provide good ventilation and avoid direct sunlight.

SIGNATURE

DATE

PRODUCT DESIGNATION

03-316-9608
P-Nitromethylaniline

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-Nitro-N-Methylaniline

 $\text{NO}_2\text{C}_6\text{H}_4\text{NHCH}_3$

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 - 152.15

BOILING POINT --	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 152°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) --		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR brown-yellow crystals.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

information not available.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Nitromethylaniline

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

Headache, drowsiness, cyanosis, mental confusion,

convulsions.

EFFECTS OF CHRONIC EXPOSURE

Fatigue, loss of appetite, headache, dizziness, blood damage,

central nervous system 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

neoprene 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 03-317-9909 P-Nitrotoluene

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 Methyl Nitrobenzene	
CHEMICAL NAME AND SYNONYMS	FORMULA
P-Nitrotoluene	CH ₃ C ₆ H ₄ NO 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.
			2144		rat	
			1231		mouse	

SECTION III PHYSICAL DATA	
BOILING POINT 238°C	VAPOR PRESSURE at 54°C
MELTING POINT 52°C	VAPOR DENSITY (Air = 1) 4.72
SPECIFIC GRAVITY (H ₂ O = 1) 1.12	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR yellowish crystals	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 223°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER
EXTINGUISHING MEDIA Water, carbon dioxide, dry chemicals.		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

P-Nitrotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5 PPM, 30 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION slight

REVELANT SYMPTOMS OF EXPOSURE

Difficulty in breathing, cyanosis, vomiting, headache.

EFFECTS OF CHRONIC EXPOSURE

Blood 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)

May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside or detached storage preferred inside storage in standard flammable
liquids cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-315-0907

3 Nitro-4 Acetylaminotoluene

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

2 Nitro-P-Acetotoluidide

CHEMICAL NAME AND SYNONYMS

3 Nitro 4 Acetyl amino Toluene

FORMULA

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

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 - 194.19

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

carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

3 Nitro-4 Acetylaminotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION slight

RELEVANT SYMPTOMS OF EXPOSURE

difficulty in breathing, cyanosis, vomiting, headache

EFFECTS OF CHRONIC EXPOSURE

blood 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)

May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

goggles

MECHANICAL (GENERAL)

GLOVES

rubber

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-315-1907
5 Nitro-2-Aminoanisole

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 5 nitro-o-anisidine	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 1-methoxy-4 nitroaniline	FORMULA $\text{NO}_2\text{C}_6\text{H}_4(\text{NH}_2)\text{OCH}_3$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 168.15

BOILING POINT --	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 141°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.21		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 390°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA water spray, carbon dioxide, dry chemical, foam		
SPECIAL FIRE FIGHTING PROCEDURES wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
5-Nitro-2-Aminoanisoie

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin

SKIN AND EYE
IRRITATION yes

REVELANT SYMPTOMS OF EXPOSURE
Headache, nausea, vomiting, weakness, stupor, cyanosis.

EFFECTS OF CHRONIC EXPOSURE
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

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

03-315-2407
5 Nitro-4-Amino-1,
3-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	5 nitro-4-amino-1,3 dimethyl-benzene	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS	6 nitro-2,4,xylidine	FORMULA (CH ₃) ₂ C ₆ H ₂ (NH ₂)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 - 166.18

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 69°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 crystalline			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none 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
5 Nitro-4-amino-1,3-Dimethyl-Benzene

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, headache, nausea, vomiting, weakness, stupor.

EFFECTS OF CHRONIC EXPOSURE
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

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

03-315-2907
3-Nitro-4 Aminophenetole

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-Nitro-4 aminophenetole

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

3 Nitro-P-Phenetidine

FORMULA

 $\text{NO}_2\text{C}_6\text{H}_3(\text{NH}_2)\text{OC}_2\text{H}_5$

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 - 182.18

BOILING POINT --	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 113°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 red crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none 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

3-Nitro-4-Aminophenetole

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION yes

REVELANT SYMPTOMS OF EXPOSURE

Cyanosis, headache, nausea, vomiting, weakness, stupor.

EFFECTS OF CHRONIC EXPOSURE

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

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

03-315-3407
3-Nitro-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 Nitro-4-Aminotoluene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

3 Nitro-P-Toluidine

FORMULA

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

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.
			3		bird	

SECTION III PHYSICAL DATA MW - 152.15

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 117°C	° F.	VAPOR DENSITY (Air = 1)	5.2
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
1.31			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
slightly soluble			
APPEARANCE AND ODOR			
red crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 315°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER

EXTINGUISHING MEDIA

Water spray, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

3-Nitro-4-Aminotoluene

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, headache, nausea, vomiting, weakness, stupor.

EFFECTS OF CHRONIC EXPOSURE

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

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 03-315-3507 4-Nitro-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 nitro-2-aminotoluene	
CHEMICAL NAME AND SYNONYMS	FORMULA
4 nitro-o-toluidine	$\text{NO}_2(\text{C}_6\text{H}_3)(\text{CH}_3)\text{NH}_2$

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

SECTION III PHYSICAL DATA		MW - 152.15
BOILING POINT	° F.	VAPOR PRESSURE mm Hg.
--		
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
107°C		
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)
1.37		
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
very slightly soluble		
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
water spray, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

4-Nitro-2-Aminotoluene

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, headache, nausea, vomiting, weakness, stupor.

EFFECTS OF CHRONIC EXPOSURE

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

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

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-315-3807 M-Nitroaniline</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 3-Nitroaniline	FORMULA $\text{NO}_2\text{C}_6\text{H}_4\text{NH}_2$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			535		rat	
			308		mouse	

SECTION III PHYSICAL DATA	
BOILING POINT $^{\circ}\text{F}$ 306 $^{\circ}\text{C}$	VAPOR PRESSURE mm Hg at 119 $^{\circ}\text{C}$ 1
MELTING POINT $^{\circ}\text{F}$ 114 $^{\circ}\text{C}$	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.43	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.09	VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR
Yellow rhombic crystals, burning sweet taste.

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 390 $^{\circ}\text{F}$	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
Water spray, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

M-Nitroaniline

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, headache, nausea, vomiting, weakness, stupor.

EFFECTS OF CHRONIC EXPOSURE

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

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

Protect against moisture and physical damage.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-315-3907 O-Nitroaniline

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 Nitroaniline	FORMULA <chem>NO2C6H4NH2</chem>

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			535		rat	
			308		mouse	

SECTION III PHYSICAL DATA		MW - 138.12
BOILING POINT 284°C	° F.	VAPOR PRESSURE at 104°C
MELTING POINT 72°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.44		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.1		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR orange needle crystals.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 390°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Water spray, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

O-Nitroaniline

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, headache, nausea, vomiting, weakness, stupor.

EFFECTS OF CHRONIC EXPOSURE

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

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

Protect against moisture and physical damage.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-315-5407 P-Nitrobenzal 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
<u>αα</u> -Dibromo-P-Nitrotoluene	
CHEMICAL NAME AND SYNONYMS	FORMULA
P-Nitrobenzal Bromide	NO ₂ C ₆ H ₄ CHBr 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 - 294.94
BOILING POINT --	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 82°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 needle-like crystals.		

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

EXTINGUISHING MEDIA water spray, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
P-Nitrobenzal Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION Slight

REVELANT SYMPTOMS OF EXPOSURE
Difficulty in breathing, cyanosis, vomiting, headache

EFFECTS OF CHRONIC EXPOSURE
Blood 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)
May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

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

SECTION IX SPECIAL PRECAUTIONS

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

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-315-6857
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
Oil of mirbane	
CHEMICAL NAME AND SYNONYMS	FORMULA
Nitrobenzene	$\text{NO}_2\text{C}_6\text{H}_5$

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.
			640		rat	
Lowest published lethal dose						
subcutaneous - rat - 640	mg/kg					
oral rabbit - 600	mg/kg					
skin rabbit - 600	mg/kg					

SECTION III PHYSICAL DATA MW - 123.11

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
211°C		at 45°C	1
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
6°C		4.3	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.20			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.2			

APPEARANCE AND ODOR

Pale yellow liquid with a characteristic odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
190°F		LOWER
METHOD USED		1.8%
C.C.		

EXTINGUISHING MEDIA

Water spray, carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES

Wear complete protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Store separate from oxidizing materials, heat or sources of ignition.

PRODUCT DESIGNATION

Nitrobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 1 PPM, 5 mg/C.M. skin

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION slight

REVELANT SYMPTOMS OF EXPOSURE Cyanosis, excitement, weakness, difficult breathing, shock and circulatory failure.

EFFECTS OF CHRONIC EXPOSURE

Headache, vertigo, blood 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)

Avoid, nitric acid, aniline with glycerine, and aluminum chloride with phenol.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

03-316-0208
P-Nitrobenzoyl 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

4-Nitrobenzoyl chloride

FORMULA

 $\text{NO}_2\text{C}_6\text{H}_4\text{COCl}$

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.
			none	available		

SECTION III PHYSICAL DATA MW - 185.57

BOILING POINT --	° F.	VAPOR PRESSURE at 154°C	mm Hg. 15
MELTING POINT 72°C	° F.	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 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

P-Nitrobenzoyl chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE

Respiratory system, skin & eye irritation, burns mouth
and digestive system.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

03-316-0688
P-Nitrobenzyl 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

FORMULA

P Nitro-a-bromotoluene

 $\text{NO}_2\text{C}_6\text{H}_4\text{CH}_2\text{Br}$

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 - 216.04

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 100°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 needle-like crystals.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

water, carbon dioxide, dry chemicals.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
P-Nitrobenzyl Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	none available	CARCINOGENIC	no
PRINCIPLE ROUTES OF ABSORPTION	inhalation, ingestion, skin	SKIN AND EYE	
		IRRITATION	slight
REVELANT SYMPTOMS OF EXPOSURE	Difficulty in breathing, cyanosis, vomiting, headache.		
EFFECTS OF CHRONIC EXPOSURE	Blood 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)
May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
	goggles
MECHANICAL (GENERAL)	GLOVES
	rubber
SPECIAL	RESPIRATOR
	self-contained
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-316-0808
P-Nitrobenzyl 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 P-Nitro- α Chlorotoluene	FORMULA $\text{NO}_2\text{C}_6\text{H}_4\text{CH}_2\text{Cl}$

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 - 171.58

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 needle-like crystals.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

PRODUCT DESIGNATION

P-Nitrobenzyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

REVELANT SYMPTOMS OF EXPOSURE

Difficulty in breathing, cyanosis, vomiting, headache.

EFFECTS OF CHRONIC EXPOSURE

Blood 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)

May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

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

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-316-1108 M-Nitrobromobenzene</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 M-Bromonitrobenzene	FORMULA <chem>BrC6H4NO2</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 - 202.02	
BOILING POINT 257°C	VAPOR PRESSURE mm Hg.
MELTING POINT 56°C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.70	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 LOWER
METHOD USED		

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

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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
M-Nitrobromobenzene

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, headache, weakness, anemia

EFFECTS OF CHRONIC EXPOSURE
hemoglobinuria

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

Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-316-1208 O-Nitrobromobenzene</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 O-Bromonitrobenzene	FORMULA BrC ₆ H ₄ 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 - 202.02	
BOILING POINT 261 °F.	VAPOR PRESSURE mm Hg.		
MELTING POINT 43 °C	VAPOR DENSITY (Air = 1)		
SPECIFIC GRAVITY (H ₂ O = 1) 1.62	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 Water spray, carbon dioxide, dry chemical, foam.		
SPECIAL FIRE FIGHTING PROCEDURES Wear self-contained breathing apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
O-Nitrobromobenzene

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, headache, weakness, anemia.		
EFFECTS OF CHRONIC EXPOSURE	hemoglobinuria		
EMERGENCY AND FIRST AID PROCEDURES	If swallowed - give emetic, get medical aid; inhalation - oxygen if needed; 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

Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-316-1308
P-Nitrobromobenzene

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 Bromonitrobenzene

FORMULA

BrC₆H₄NO₂

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.
256°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
127°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.94			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
insoluble			
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

Water spray, carbon dioxide, dry chemical, foam.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
P-Nitrobromobenzene

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, headache, weakness, anemia		
EFFECTS OF CHRONIC EXPOSURE	hemoglobinuria		
EMERGENCY AND FIRST AID PROCEDURES	If swallowed - give emetic, get medical aid; inhalation - oxygen as needed; wash from skin & eyes.		

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

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

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-316-1708 M-Nitrochlorobenzene

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-Chloronitrobenzene	FORMULA $C_6H_4ClNO_2$

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 - 157.56	
BOILING POINT 236 ⁰	VAPOR PRESSURE mm Hg.
MELTING POINT 44 ⁰ C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.34	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR yellow crystals, aromatic odor.	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 261 ⁰ F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

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

SPECIAL FIRE FIGHTING PROCEDURES wear self-contained breathing apparatus.
--

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

M-Nitrochlorobenzene

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, headache, weakness, anemia.

EFFECTS OF CHRONIC EXPOSURE

Hemoglobinuria

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid; inhalation - oxygen if needed; 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

Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

<p align="center">PRODUCT DESIGNATION.</p> <p>03-316-1808 O-nitrochlorobenzene</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 O-chloronitrobenzene	FORMULA CLC H NO ₂ 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.
			288		rat	
			135		mouse	

SECTION III PHYSICAL DATA MW - 157.56	
BOILING POINT 246°C	VAPOR PRESSURE mm Hg.
MELTING POINT 33°C	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.31	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR yellow crystals, aromatic odor.	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 261°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA Water spray, carbon dioxide, dry chemical, foam.
SPECIAL FIRE FIGHTING PROCEDURES Wear self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
O-Nitrochlorobenzene

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, headache, weakness, anemia

EFFECTS OF CHRONIC EXPOSURE
hemoglobinuria

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

goggles

GLOVES

SPECIAL

rubber

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-316-1908 P-Nitrochlorobenzene</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 P Chloronitrobenzene	FORMULA $C_6H_4ClNO_2$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			420		rat	
			1414		mouse	

SECTION III PHYSICAL DATA MW - 157.56			
BOILING POINT 242°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 84°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.29			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
insoluble			
APPEARANCE AND ODOR			
yellow crystals, aromatic odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 261°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		
water spray, carbon dioxide, dry chemical, foam		
SPECIAL FIRE FIGHTING PROCEDURES		
wear self-contained breathing apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
P-Nitrochlorobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	TLV - 1 mg/C.M.	CARCINOGENIC NO
PRINCIPLE ROUTES OF ABSORPTION	inhalation, ingestion, skin	SKIN AND EYE IRRITATION moderate
RELEVANT SYMPTOMS OF EXPOSURE	cyanosis, headache, weakness, anemia	
EFFECTS OF CHRONIC EXPOSURE	hemoglobinuria	
EMERGENCY AND FIRST AID PROCEDURES	If swallowed - give emetic, get medical aid; inhalation - oxygen if needed; wash from skin & eyes.	

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
MECHANICAL (GENERAL)	goggles
SPECIAL	GLOVES
OTHER PROTECTIVE EQUIPMENT	rubber
	RESPIRATOR
	self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

<p align="center">PRODUCT DESIGNATION</p> <p>03-316-3108 2 Nitro-1,4 Diaminobenzene</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 2 Nitro - 1,4 Diaminobenzene	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 2 Nitro-P-Phenylenediamine	FORMULA $\text{NO}_2\text{C}_6\text{H}_3(\text{NH}_2)_2$

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

SECTION III PHYSICAL DATA			
BOILING POINT ° F.	VAPOR PRESSURE mm Hg.		
MELTING POINT 140°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 --			

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

EXTINGUISHING MEDIA information not available
--

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
2 Nitro-1,4 Diaminobenzene

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, headache, nausea, vomiting, weakness, stupor

EFFECTS OF CHRONIC EXPOSURE
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

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
information not available

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-316-3308
4-Nitro-1,2-Diaminobenzene

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

4 Nitro-1,2-Diaminobenzene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

4 Nitro-P-Phenylenediamine

FORMULA

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

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.

MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
202°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

dark red crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

information not available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
4-Nitro-1,2-Diaminobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion, skin SKIN AND EYE
IRRITATION yes

REVELANT SYMPTOMS OF EXPOSURE
cyanosis, headache, nausea, vomiting, weakness, stupor.

EFFECTS OF CHRONIC EXPOSURE
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
Information not available.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-316-3708
O-Nitrodiethylaniline

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-Nitro-N, N-diethylaniline	FORMULA $\text{NO}_2\text{C}_6\text{H}_4\text{N}(\text{C}_2\text{H}_5)_2$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 194.24

BOILING POINT --	° F.	VAPOR PRESSURE at 155°C	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 slightly soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR yellow liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA information not available		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
O-Nitrodiethylaniline

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	Weakness, tremors, cyanosis, drowsiness.		
EFFECTS OF CHRONIC EXPOSURE	Fatigue, loss of appetite, headache, dizziness.		
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

<p align="center">PRODUCT DESIGNATION</p> <p>03-316-4108 M-Nitrodimethylaniline</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 3-Nitro-N,N-dimethylaniline	FORMULA $\text{NO}_2\text{C}_6\text{H}_4\text{N}(\text{CH}_3)_2$

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 - 166.18

BOILING POINT 280°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 insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR yellow to red crystals.			

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

PRODUCT DESIGNATION
M-Nitrodimethylaniline

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	weakness, tremors, cyanosis, drowsiness		
EFFECTS OF CHRONIC EXPOSURE	Fatigue, loss of appetite, headache, dizziness		
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

03-316-4608
2-Nitro,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 Nitro-P-Xylene	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 2-Nitro-1,4-Dimethylbenzene	FORMULA (NO ₂)C ₆ H ₃ (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 - 151.16

BOILING POINT 239°C	° F.	VAPOR PRESSURE at 102°C	10 mm Hg.
MELTING POINT ---	° F.	VAPOR DENSITY (Air = 1)	
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 yellow liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Information - not available.		
SPECIAL FIRE FIGHTING PROCEDURES		

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2-Nitro-1,4-Dimethylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION

slight

RELEVANT SYMPTOMS OF EXPOSURE

difficulty in breathing, cyanosis, vomiting, headache.

EFFECTS OF CHRONIC EXPOSURE

blood 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)

May explode when heated with sulfuric acid

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

goggles

MECHANICAL (GENERAL)

GLOVES

rubber

SPECIAL

RESPIRATOR

self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Information not available.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-316-4808
3-Nitro-1,2-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 Nitro-O-Xylene	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 3-Nitro-1,2-Dimethylbenzene	FORMULA $\text{NO}_2\text{C}_6\text{H}_3(\text{CH}_3)_2$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 151.16

BOILING POINT 245°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 15°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.147		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		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
information not available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

3-Nitro-1,2-Dimethylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION slight

RELEVANT SYMPTOMS OF EXPOSURE

Difficulty in breathing, cyanosis, vomiting, headache.

EFFECTS OF CHRONIC EXPOSURE

Blood 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)

May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Information not available.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-316-7108
P-Nitrofluorobenzene

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-Fluoronitrobenzene	FORMULA $\text{FC}_6\text{H}_4\text{NO}_2$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 141.10

BOILING POINT 207°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 27°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.32		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR yellow crystal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA water spray, carbon dioxide, dry chemical, foam.		
SPECIAL FIRE FIGHTING PROCEDURES wear self-contained breathing apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
P-Nitrofluorobenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL none available CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE
inhalation, ingestion, skin IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE
cyanosis, headache, weakness, anemia

EFFECTS OF CHRONIC EXPOSURE
hemoglobinuria

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give emetic, get medical aid; inhalation - oxygen if needed; 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)	GLUVES Rubber
SPECIAL	RESPIRATOR Self-contained
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-316-8108 M-Nitroiodobenzene</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 M-Iodonitrobenzene	FORMULA IC H NO. 6-4-3

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 - 249.02	
BOILING POINT 280°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 38°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.88		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		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 spray, carbon dioxide, dry chemical, foam		
SPECIAL FIRE FIGHTING PROCEDURES Wear self-contained breathing apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
M-Nitroiodobenzene

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, headache, weakness, anemia

EFFECTS OF CHRONIC EXPOSURE hemoglobinuria

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

Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-316-8208
O-Nitroiodobenzene

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-Iodonitrobenzene

FORMULA

 $\text{IC}_6\text{H}_4\text{NO}_2$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 249.02

BOILING POINT 289°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 52°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.88		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

water spray, carbon dioxide, dry chemical, foam.

SPECIAL FIRE FIGHTING PROCEDURES

wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
O-Nitroiodobenzene

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, headache, weakness, anemia.

EFFECTS OF CHRONIC EXPOSURE
hemoglobinuria

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give emetic, get medical aid; inhalation - oxygen if needed; 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
Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-316-8308
P-Nitroiodobenzene

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-Iodonitrobenzene	FORMULA IC ₆ H ₄ 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 - 249.02

BOILING POINT 287°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 171°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 2.27		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 none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA water spray, carbon dioxide, dry chemical, foam.		
SPECIAL FIRE FIGHTING PROCEDURES Wear self-contained breathing apparatus.		

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Nitroiodobenzene

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, headache, weakness, anemia.

EFFECTS OF CHRONIC EXPOSURE

hemoglobinuria

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, get medical aid; inhalation - oxygen if needed; 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

Store away from oxidizing materials and sources of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-316-8608
Nitromesitylene

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

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 165.19

BOILING POINT 255°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 44°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 crystalline		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

information not available.

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Nitromesitylene

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 chemical pneumonia, central nervous system depression, frequent bleeding.

EFFECTS OF CHRONIC EXPOSURE Nervous tension, anxiety, asthmatic bronchitis.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - 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

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

03-316-9108
Nitromethane

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

Nitromethane

FORMULA

CH₃NO₂

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			940		rat	
inhalation - monkey	2446 mg/C.M.		1440		mouse	
				See Note		

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
101°C		at 25°C	38
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-29°C		2.11	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.14			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
9.5			
APPEARANCE AND ODOR			

colorless liquid, strong odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
95°F		LOWER
METHOD USED		
C.C.		

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

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Explosion hazard - moderate when exposed to heat or flame.

PRODUCT DESIGNATION

Nitromethane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 100 PPM, 250 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

moderate

REVELANT SYMPTOMS OF EXPOSURE

Narcosis, irritation of mucous membrane, central

nervous system excitation.

EFFECTS OF CHRONIC EXPOSURE

Liver and spleen damage.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - induce vomiting, get medical aid, gastric lavage; inhalation - artificial respiration, oxygen if needed; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Avoid AlCl_3 with organic matter, Ca(OH)_2 , CaOCl , hydrocarbons, organic amines,

HAZARDOUS DECOMPOSITION PRODUCTS

NaOH and KOH

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

03-317-1209
5 Nitro-1-Naphthylamine

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 Nitro α -Naphthylamine

FORMULA

 $\text{NO}_2\text{C}_{10}\text{H}_6\text{NH}_2$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 188.19

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
--			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
119°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

red needle-like crystals.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

information not available.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
5 Nitro-1-Naphthylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	none available	CARCINOGENIC	suspected
PRINCIPLE ROUTES OF ABSORPTION	inhalation, ingestion, skin	SKIN AND EYE IRRITATION	moderate
REVELANT SYMPTOMS OF EXPOSURE	Cyanosis, headache, nausea, vomiting, weakness, stupor.		
EFFECTS OF CHRONIC EXPOSURE	Liver damage, possible bladder tumors.		
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

03-317-4709
P-Nitrophenylhydrazine

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-Nitrophenylhydrazine

FORMULA

$$\text{NO}_2\text{C}_6\text{H}_4\text{NHNH}_2$$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 153.14

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
157°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
soluble in hot water			
APPEARANCE AND ODOR			
orange-red crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

information not available.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Nitrophenylhydrazine

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 Irritation of skin, eyes and mucous membranes, gastroentrio disturbances, anemia.

EFFECTS OF CHRONIC EXPOSURE

Blood and liver damage, loss of appetite.

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-317-4909 P-Nitrophenylhydrazine 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	FORMULA
----------------------------	---------

P-Nitrophenylhydrazine Hydrochloride	$\text{NO}_2\text{C}_6\text{H}_4\text{NHNH}_2\text{HCl}$
--------------------------------------	--

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 - 189.61

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 215°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 orange-red crystals.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA information not available.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Nitrophenylhydrazine Hydrochloride

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 eyes, skin & 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)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 03-317-6209 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-Nitropropane	FORMULA $C_3H_7NO_2$

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.
Lowest published lethal dose - oral - rat - 1000 mg/kg.			800		mouse	

SECTION III PHYSICAL DATA MW - 89.09	
BOILING POINT 132°C	VAPOR PRESSURE at 25°C 13 mm Hg.
MELTING POINT -108°C	VAPOR DENSITY (Air = 1) 3.06
SPECIFIC GRAVITY (H ₂ O = 1) 1.00	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 9.5	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, with disagreeable odor.	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 120°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED T.O.C.		LOWER

EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical or water spray.
SPECIAL FIRE FIGHTING PROCEDURES Wear protective clothing and self-contained breathing apparatus..
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION	
1-Nitropropane	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
TLV - 25 PPM, 90 mg/C.M.	no
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE
Inhalation, ingestion	IRRITATION moderate
RELEVANT SYMPTOMS OF EXPOSURE Headache, dizziness, nausea, vomiting, diarrhea, restlessness, muscular uncoordination.	
EFFECTS OF CHRONIC EXPOSURE	
Liver, kidney and heart damage.	
EMERGENCY AND FIRST AID PROCEDURES If swallowed - induce vomiting, get medical aid, gastric lavage; inhalation - artificial respiration, oxygen as needed, wash skin & eyes.	
SECTION VI REACTIVITY DATA	
CONDITIONS CONTRIBUTING TO INSTABILITY	
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION	
INCOMPATIBILITY (MATERIALS TO AVOID)	
Unstable with amines, acids, alkalis.	
HAZARDOUS DECOMPOSITION PRODUCTS	
SECTION VII SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN 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	
Out side or detached storage preferred, store inside in standard flammable liquids cabinet, isolate from other flammable liquids.	
OTHER PRECAUTIONS	
Avoid contact with Ca(OH)_2 , NaOH, KOH, hydrocarbons.	
SIGNATURE	DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-317-6309 2-Nitropropane</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-Nitropropane	FORMULA $C_3H_7NO_2$

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			
1. Lowest published toxic concentration in air - inhalation - human 15 PPM.						
2. Lowest published lethal dose - oral - rat 500 mg/C.M.						

SECTION III PHYSICAL DATA			
BOILING POINT 120°C	° F.	VAPOR PRESSURE at 25°C	MW - 89.09 20 mm Hg.
MELTING POINT -93°C	° F.	VAPOR DENSITY (Air = 1) 3.06	
SPECIFIC GRAVITY (H ₂ O = 1) 0.99		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 1.7		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid with disagreeable odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 103°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED T.O.C.		LOWER 2.6%
EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical or water spray.		

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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION 2 Nitropropane	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL TLV - 25 PPM, 90 mg/C.M.	CARCINOGENIC no
PRINCIPLE ROUTES OF ABSORPTION inhalation, ingestion	SKIN AND EYE IRRITATION moderate
REVELANT SYMPTOMS OF EXPOSURE Headache, dizziness, nausea, vomiting, diarrhea, restlessness, muscular uncoordination.	
EFFECTS OF CHRONIC EXPOSURE Liver, kidney and heart damage.	
EMERGENCY AND FIRST AID PROCEDURES If swallowed - induce vomiting, get medical aid, gastric lavage; inhalation - artificial respiration, oxygen as needed; wash from skin & eyes.	
SECTION VI REACTIVITY DATA	
CONDITIONS CONTRIBUTING TO INSTABILITY	
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION	
INCOMPATIBILITY (MATERIALS TO AVOID) Unstable with amines, acids, alkalis.	
HAZARDOUS DECOMPOSITION PRODUCTS	
SECTION VII SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
WASTE DISPOSAL METHOD	
SECTION VIII SPECIAL PROTECTION INFORMATION	
VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles
MECHANICAL (GENERAL)	GLOVES Rubber
SPECIAL	RESPIRATOR Self-contained
OTHER PROTECTIVE EQUIPMENT	
SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Outside or detached storage preferred, store inside in standard flammable liquids cabinet, isolate from other flammable liquids.	
OTHER PRECAUTIONS Avoid contact with $\text{Ca}(\text{OH})_2$, NaOH, KOH, hydrocarbon.	
SIGNATURE	DATE

PRODUCT DESIGNATION

03-317-7209
2-Nitroresorcinol

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-Nitroresorcinol

FORMULA

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

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 155.11

BOILING POINT d>180°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 83°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			

crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

information not available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

2-Nitroresorcinol

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 Itching, dermatitis, restlessness, cyanosis, dizziness, tremors, convulsion and death.

EFFECTS OF CHRONIC EXPOSURE

Liver, kidney and lung 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

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 (GENFRAI)

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 03-317-8009 P-Nitrosodiethylaniline
--

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 N,N-Diethyl-P-Nitrosoaniline	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS P-Nitrosodiethylaniline	FORMULA (C ₂ H ₅) ₂ NC ₆ H ₄ NO

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 84°C	VAPOR DENSITY (Air = 1.)
SPECIFIC GRAVITY (H ₂ O = 1) 1.24	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very slightly soluble	VOLATILE % Vol. * % Wt.
APPEARANCE AND ODOR green crystals	

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

EXTINGUISHING MEDIA Alcohol foam, water spray, carbon dioxide and dry chemical.
--

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Nitrosodiethylaniline

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, dermatitis.

EFFECTS OF CHRONIC EXPOSURE Fatigue, loss of appetite, headache, dizziness, dermatitis.

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

03-317-8209
P-Nitrosodimethylaniline

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-Nitrosodimethylaniline	FORMULA (CH ₃) ₂ NC ₆ H ₄ NO

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.
			65		rat	
Note:						
Lowest published lethal dose						
Oral - man 650 mg/kg.			See Note			

SECTION III PHYSICAL DATA MW - 150.14

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 87°C	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 green leaflets	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Nitrosodimethylaniline

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

neoplastic

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE

Weakness, tremors, cyanosis, drowsiness, dermatitis.

EFFECTS OF CHRONIC EXPOSURE

Fatigue, loss of appetite, headache, dizziness, 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

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-317-9409
Nitrosopiperidene

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 Nitrosopiperidene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Nitrosopiperidene

FORMULA

NON(CH₂)₂CH₂

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.
				100	Rat	

SECTION III PHYSICAL DATA MW - 114.15

BOILING POINT 218°C	° F.	VAPOR PRESSURE at 110°C	mm Hg. 23
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.06		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Yellow oil, amine-like odor.			

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 to decomposition point, give off toxic oxides of nitrogen.

PRODUCT DESIGNATION

Nitrosopiperidene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

REVELANT SYMPTOMS OF EXPOSURE Weakness, nausea, vomiting, salivation, muscular paralysis, asphyxia; eye and skin irritation; respiratory distress, convulsions.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.

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

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>03-317-9609</p> <p>Nitrosoresorcinol</p> <p>Sodium Salt</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
Nitrosoresorcinol Sodium Salt	$\text{NO}_2\text{C}_6\text{H}_3(\text{OH})\text{ONa}$

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		For P-Nitrosoresorcinol	
BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 148 d°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR yellow crystals			

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

EXTINGUISHING MEDIA
information not available.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Nitrosoresorcinol Sodium Salt

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 Itching, dermatitis, restlessness, cyanosis, dizziness, tremors, convulsions and death.

EFFECTS OF CHRONIC EXPOSURE

Liver, kidney and lung 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

Rubber

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-317-9709
M-Nitrotoluene

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-Methylnitrobenzene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

M-Nitrotoluene

FORMULA

$$\text{CH}_3\text{C}_6\text{H}_4\text{NO}_2$$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1072		rat	
			330		mouse	
			2400		rabbit	
			3600		guinea pig	

SECTION III PHYSICAL DATA MW - 137.1

BOILING POINT 232°C	° F.	VAPOR PRESSURE at 50°C	mm Hg.
MELTING POINT 15°C	° F.	VAPOR DENSITY (Air = 1)	1
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.16			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.05			
APPEARANCE AND ODOR			
liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 233°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER
EXTINGUISHING MEDIA		
Water, carbon dioxide, dry chemical.		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

M-Nitrotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5 PPM, 30 mg/CM

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Slight

REVELANT SYMPTOMS OF EXPOSURE

Difficulty in breathing, cyanosis, vomiting, headache.

EFFECTS OF CHRONIC EXPOSURE

Blood 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)

May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside or detached storage preferred inside storage in standard flammable
liquids cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-317-9809
O-Nitrotoluene

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 Methyl Nitrobenzene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

O-Nitrotoluene

FORMULA

CH3C6H4NO2

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.
			891		rat	
			2462		mouse	

SECTION III PHYSICAL DATA MW - 137.1

BOILING POINT 222°C	° F.	VAPOR PRESSURE at 50°C	mm Hg.
MELTING POINT -4°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.16			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.07			
APPEARANCE AND ODOR yellowish liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 223°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
O-Nitrotoluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	TLV - 5 PPM, 30 mg/C.M.	CARCINOGENIC	no
PRINCIPLE ROUTES OF ABSORPTION	inhalation, ingestion, skin	SKIN AND EYE	
		IRRITATION	slight
RELEVANT SYMPTOMS OF EXPOSURE	Difficulty in breathing, cyanosis, vomiting, headache.		
EFFECTS OF CHRONIC EXPOSURE	Blood 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)
May explode when heated with sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

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

SECTION IX SPECIAL PRECAUTIONS

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

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION 03-321-0301 Oxalyl 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 Oxalyl Chloride	FORMULA ClOCCOC1

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 - 126.93
BOILING POINT 64°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -12°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.49		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND 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 - avoid water.		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
Oxalyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE Cyanosis, coughing, headache, pulmonary edema,
ulceration of skin, dizziness.

EFFECTS OF CHRONIC EXPOSURE Erosion of teeth, jaw necrosis, bronchial irritation and
chronic cough.

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)

water and 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

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-326-0402
Palmitoyl 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 Palmitoyl Chloride	FORMULA $\text{CH}_3(\text{CH}_2)_{14}\text{COCl}$

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 - 274.88

BOILING POINT ° F.	VAPOR PRESSURE at 195°C mm Hg.
MELTING POINT 12°C ° F.	VAPOR DENSITY (Air = 1) 17
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 Use carbon dioxide or dry chemical.		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
Palmitoyl 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, bronchial irritation
and chronic cough.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, artificial respiration as needed;
ingestion - 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 water.

HAZARDOUS DECOMPOSITION PRODUCTS
Produces HCl. on contact with water.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 goggles
SPECIAL	GLOVES Rubber
OTHER PROTECTIVE EQUIPMENT	RESPIRATOR With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in cool, dry area away from heat inside storage in standard flammable
liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

03-326-3402
Pentamethylene 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 1,5 Dibromopentane	FORMULA $\text{Br}(\text{CH}_2)_5\text{Br}$

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 - 229.96

BOILING POINT 222°C	° F.	VAPOR PRESSURE at 108°C	mm Hg. 20
MELTING POINT -40°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.69		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 none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Water, foam, carbon dioxide and dry chemical.		
SPECIAL FIRE FIGHTING PROCEDURES Water may be ineffective.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
Pentamethylene Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE
eye irritation, narcosis, drowsiness, headache, vomiting.

EFFECTS OF CHRONIC EXPOSURE
dermatitis, 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 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

03-001-3703
Perchloric 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 Perchloric Acid	FORMULA HClO ₄

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 100.46

BOILING POINT 39°C. at 56 mm.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -112°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.764		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid, odorless.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 72% LOWER 60%
METHOD USED		
EXTINGUISHING MEDIA Water spray		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Explodes on contact with most organic materials.		

PRODUCT DESIGNATION	
Perchloric Acid	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
Not established	No
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE
Inhalation of vapor or mist.	IRRITATION Severe
RELEVANT SYMPTOMS OF EXPOSURE Conjunctivitis, pulmonary edema, choking, headache, dizziness	
cyanosis, ulceration of skin.	
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. Inhalation: wash skin	
and eyes - use artificial respiration if necessary - obtain medical aid.	
SECTION VI REACTIVITY DATA	
CONDITIONS CONTRIBUTING TO INSTABILITY	
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION	
INCOMPATIBILITY (MATERIALS TO AVOID) Acetic anhydride, bismuth and its alloys, alcohol, paper,	
wood.	
HAZARDOUS DECOMPOSITION PRODUCTS	
SECTION VII SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	
Cover with reducing agents such as bisulfites, transfer sludge into a large container of water for disposal.	
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	
Protect glass container from breaking. Keep from freezing and heat.	
OTHER PRECAUTIONS	
Keep away from combustibles, organics, strong dehydrating reducing, and oxidizing materials.	
SIGNATURE	DATE

PRODUCT DESIGNATION

M-Phenetidine
03-326-5902

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 amino - 3 Ethoxybenzene	
CHEMICAL NAME AND SYNONYMS	FORMULA
M Aminophenetol	NH ₂ C ₆ H ₄ 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.
			none available			

SECTION III PHYSICAL DATA MW - 137.18

BOILING POINT 248°C	° F.	VAPOR PRESSURE at 125°C	mm Hg. 7
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
METHOD USED		LOWER
EXTINGUISHING MEDIA carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES water or foam may cause frothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

M-Phenetidine

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, hypothermia, headache, drowsiness, vomiting,

irritation of alimentary tract, nephritis.

EFFECTS OF CHRONIC EXPOSURE

Weight loss, anemia, weakness, irritability, possible liver damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - emetic or gastric lavage, get medical attention; 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

03-326-6002
O-Phenetidine

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 amino - 2 Ethoxybenzene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

O-Aminophenetol

FORMULA

 $C_8H_9O_2NH_2$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 137.18

BOILING POINT 229°C	° F.	VAPOR PRESSURE 133°C	25 ^{mm} Hg.
MELTING POINT < -21°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 oil			

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

water or foam may cause frothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
O-Phenetidine

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 Cyanosis, hypothermia, headache, drowsiness, vomiting,
irritation of alimentary tract, nephritis.

EFFECTS OF CHRONIC EXPOSURE Weight loss, anemia, weakness, irritability, possible
liver damage.

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

03-326-6102
P-Phenetidine

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 Amino - 4 Ethoxybenzene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

P-Aminophenetol

FORMULA

$$\text{C}_6\text{H}_4\text{OC}_2\text{H}_5\text{NH}_2$$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 137.18

BOILING POINT 255°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 3°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.06		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very slightly		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 241°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA

carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

water or foam may cause frothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Phenetidine

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, hypothermia, headache, drowsiness, vomiting,
~~irritation of alimentary tract, nephritis.~~

EFFECTS OF CHRONIC EXPOSURE

Weight loss, anemia, weakness, irritability, possible liver damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - emetic or gastric lavage,
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

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>03-327-0603 Phenylacetyl Chloride</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 Phenylacetyl Chloride	FORMULA $C_6H_5CH_2COCl$

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 170°C at 250 mm	VAPOR PRESSURE at 95°C 12 mm Hg.
MELTING POINT	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.17	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 LOWER
METHOD USED		
EXTINGUISHING MEDIA carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS reacts with water		

PRODUCT DESIGNATION

Phenyl Acetyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE Cyanosis, coughing, headache, pulmonary edema, ulceration of skin, dizziness.

EFFECTS OF CHRONIC EXPOSURE Erosion of teeth, jaw necrosis, bronchial irritation and chronic cough.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - artificial respiration if necessary; ingestion - drink water, milk of magnesia, 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 water.

HAZARDOUS DECOMPOSITION PRODUCTS

Produces HCl with water.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry well-ventilated room; inside storage in standard flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-327-2603
M-Phenylenediamine

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 Aminoaniline

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

1,3 Aminobenzene

FORMULA

 $C_6H_4(NH_2)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Notes:			See Notes			
Lowest published lethal dose						
Oral - rat 80 mg/kg						
Subcutaneous - rat 80 mg/kg						
Intravenous - dog 17 mg/kg						
Oral - cat 300 mg/kg						
Subcutaneous - rabbit 200 mg/kg						

SECTION III PHYSICAL DATA MW - 108.16

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
283°C			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
63°C			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.14			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
84			
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

water, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

M-Phenylenediamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

ingestion (mainly) inhalation

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE

Eye irritation, headache, cyanosis, drowsiness,
mental confusion, dermatitis.

EFFECTS OF CHRONIC EXPOSURE

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

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 03-327-2813 P-Phenylene 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 4 Aminoaniline	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 1,4 Diaminobenzene	FORMULA $C_6H_4(NH_2)_2$

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
Notes:			See Notes		
Lowest published lethal dose					
Oral - rat 100 mg/kg					
Subcutaneous - rat 170 mg/kg					
Intravenous - dog 17 mg/kg					
Intraperitoneal - rat 50 mg/kg					
Oral - cat - 100 mg/kg					
Subcutaneous - rabbit 200 mg/kg					

SECTION III PHYSICAL DATA MW - 108.16	
BOILING POINT 267°C	VAPOR PRESSURE mm Hg.
MELTING POINT 140°C	VAPOR DENSITY (Air = 1) 3.72
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 3.8	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless monoclinic crystals	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 312	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER

EXTINGUISHING MEDIA water, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

P-Phenylene Diamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

0.1 mg/C.M. (skin)

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION severe

REVELANT SYMPTOMS OF EXPOSURE

dermatitis, eye irritation.

EFFECTS OF CHRONIC EXPOSURE

Allergenic bronchial asthma, dermatitis, 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 03-327-2903 M-Phenylenediamine 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 1,4 Diaminobenzene dihydrochloride	FORMULA $C_6H_4(NH_2)_2 \cdot 2HCl$

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
			see note		
Notes:					
Intraperitoneal - mouse	LD50 100 mg/kg				
Intraperitoneal - rat	ID 50 325 mg/kg				

SECTION III PHYSICAL DATA	
BOILING POINT -- ° 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 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
METHOD USED		LOWER

EXTINGUISHING MEDIA water, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

M-Phenylenediamine Dihydrochloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

ingestion (mainly)

SKIN AND EYE

IRRITATION

slight

RELEVANT SYMPTOMS OF EXPOSURE Dermatitis, headache, cyanosis, drowsiness, mental confusion.

EFFECTS OF CHRONIC EXPOSURE

Liver damage

EMERGENCY AND FIRST AID PROCEDURES

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

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-247-5809 Phenyl 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 Diphenyl Ether	FORMULA (C ₆ H ₅) 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: Lowest published lethal dose - oral - rat 400 mg/kg			See note:			

SECTION III PHYSICAL DATA	
BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 257°C ° F.	VAPOR DENSITY (Air = 1) 5.86
SPECIFIC GRAVITY (H ₂ O = 1) 1.07	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless crystals, geranium odor.	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 239°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA water, alcohol foam, carbon dioxide, dry chemical
--

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Phenyl Ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 1 PPM, 7 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION mild

REVELANT SYMPTOMS OF EXPOSURE

nausea, loss of appetite

EFFECTS OF CHRONIC EXPOSURE

liver spleen; kidney and thyroid damage

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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

03-327-3603
B-Phenylethyl 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 Bromoethyl Benzene

FORMULA

$C_6H_5C_2H_4Br$

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 - 185.07

BOILING POINT ° F.	VAPOR PRESSURE 102°C	20 mm Hg.
See vapor pressure		
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.
insoluble		
APPEARANCE AND ODOR		
liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT none 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

B-Phenylethyl Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none 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 - 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 breathing apparatus

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-327-5103 Phenylhydrazine
--

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 Phenylhydrazine	FORMULA <chem>C6H5NHNH2</chem>

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.
			188		rat	

SECTION III PHYSICAL DATA	
BOILING POINT 243°C MELTING POINT 19.6°C SPECIFIC GRAVITY (H ₂ O = 1) 1.10 SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble APPEARANCE AND ODOR yellow, monoclinic crystals or oil.	MW - 108.14 VAPOR PRESSURE at 72°C VAPOR DENSITY (Air = 1) 3.7 EVAPORATION RATE (____ = 1) VOLATILE % Vol. % Wt.

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 192°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER
EXTINGUISHING MEDIA Alcohol foam, water, carbon dioxide.		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS
When heated to decomposition point, it gives off fumes of nitrogen compounds.

PRODUCT DESIGNATION
Phenylhydrazine

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 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
	Self-contained
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-327-5203
Phenylhydrazine 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 Phenylhydrazine Hydrochloride	FORMULA C ₆ H ₅ NHNH ₂ ·HCl

SECTION II HAZARDOUS INGREDIENTS 6 5 2

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 - 144.61

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 245°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 yellow powder			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA
alcohol foam, water, carbondioxide

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Phenylhydrazine 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

REVELANT SYMPTOMS OF EXPOSURE Irritation of skin, eyes and mucous membranes, gastroentric 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

03-327-5603
Phenyl Isocyanate

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

Benzene Isocyanate
CHEMICAL NAME AND SYNONYMS

FORMULA

Phenyl IsocyanateC₆H₅NCO

SECTION II HAZARDOUS INGREDIENTS 6 5

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

SECTION III PHYSICAL DATA

MW - 119.12

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
163°C		at 62°C	13
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-30°C			
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			
liquid with acrid odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water, alcohol foam, carbon dioxide or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus and goggles.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Phenyl Isocyanate

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 mucous membrane irritation; skin irritation.

EFFECTS OF CHRONIC EXPOSURE
Liver and kidney damage.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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>Self-contained</u>
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION 03-327-6103 Phenyl Isothiocyanate
--

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 Benzene 1 Isothiocyanate	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Phenyl Isothiocyanate	FORMULA <chem>C6H5NCS</chem>

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	

SECTION III PHYSICAL DATA			
BOILING POINT 221°C	° F.	VAPOR PRESSURE at 90°C	mm Hg. 15
MELTING POINT -21°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.14		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		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 Water, alcohol foam, carbon dioxide, or dry chemical.
--

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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Phenyl Isothiocyanate

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 mucous membrane irritation; skin irritation.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give emetic, medical aid, gastric lavage;
inhalation - rest, give oxygen as needed; 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

<p align="center">PRODUCT DESIGNATION</p> <p>03-327-7603</p> <p>P-Phenylphenacyl Bromide</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 Bromo-P-Phenylacetophenone	FORMULA $C_{15}H_{13}BrO_2$

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.
MELTING POINT 126° 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 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

P Phenylphenacyl 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

Eye irritation, corneal haziness and pain; burning of throat; skin irritation.

EFFECTS OF CHRONIC EXPOSURE

--

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

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-327-8103
B-Phenylpropionyl 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 Hydrocinnamoyl Chloride	FORMULA $C_6H_5CH_2CH_2COCl$

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	MW - 168.82	mm Hg.
see vapor pressure		at 120°C		20
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)		
-5°C		EVAPORATION RATE (_____ = 1)		
SPECIFIC GRAVITY (H ₂ O = 1)		VOLATILE	% Vol.	% Wt.
decomposes				
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
carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Reacts with water.

PRODUCT DESIGNATION

B-Phenylpropionyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE Cyanosis, coughing, headache, pulmonary edema, ulceration of skin, dizziness.

EFFECTS OF CHRONIC EXPOSURE Erosion of teeth, jaw necrosis, bronchial irritation and chronic cough.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - artificial respiration if necessary; ingestion - drink water, milk of magnesia, 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 water

HAZARDOUS DECOMPOSITION PRODUCTS

Produces HCl with water

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

Rubber

SPECIAL

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry, well-ventilated room; inside storage in standard flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-328-0704
1-Phenylsemicarbazide

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 Cryogenine	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 1-Phenylsemicarbazide	FORMULA $C_6H_5NHNHCONH_2$

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			
Intraperitoneal - rat LD50 55 mg/kg						

SECTION III PHYSICAL DATA

MW - 151.17

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 176	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble in hot water		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR			

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
1-Phenylsemicarbazide

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 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 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 Self-contained
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-328-1704
4 Phenylthiosemicarbazide

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

4 Phenylthiosemicarbazide

C₆H₅NHNHCSNH₂

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 Note			
1. Lowest published lethal dose						
oral - rat 50 mg/kg						
2. Lowest published lethal dose						
intraperitoneal - mouse 15 mg/kg.						

SECTION III PHYSICAL DATA MW - 167.23

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
140°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

crystals

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

alcohol foam, dry chemical, carbon dioxide.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

4 Phenylthiosemicarbazide

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 Irritation of skin, eyes and mucous membranes, gastroentric 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)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

03-328-2204
Phenylthiourea

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

Phenylcarbamide

FORMULA

 $C_6H_5HN-CS-NH_2$

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.
			3		rat	
			10		mouse	
			40		rabbit	

SECTION III PHYSICAL DATA

MW - 152.22

BOILING POINT

° F.

VAPOR PRESSURE

mm Hg.

MELTING POINT

° F.

VAPOR DENSITY (Air = 1)

154°C

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

1.3

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

slightly soluble

APPEARANCE AND ODOR

needle-like crystals - bitter taste.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

none available

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

carbon dioxide, water.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

Burns to form SO₂ fumes.

PRODUCT DESIGNATION
Phenylthiourea

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL none available CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE
inhalation, ingestion IRRITATION slight

REVELANT SYMPTOMS OF EXPOSURE
dermatitis

EFFECTS OF CHRONIC EXPOSURE Ingestion - depression of bone marrow, anemia, leukopenia,
allergic skin eruptions.

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

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

On decomposition emits toxic fumes of sulfur and nitrogen.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

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

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION P_2O_5 Phosphoric Anhydride 03-001-4506
--

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 Phosphorus Pentoxide	FORMULA P_2O_5

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 - 141.94	
BOILING POINT sublimes easily at 300°C.	VAPOR PRESSURE at 384°C.
MELTING POINT 657	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.39	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White, fluffy, crystalline, deliquescent powder.	

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

EXTINGUISHING MEDIA Avoid water

SPECIAL FIRE FIGHTING PROCEDURES Wear self-contained respirator.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Phosphoric Anhydride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 1 mg/m³

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of powder, ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Coughing, choking, headache, dizziness, pulmonary edema, corrosion of skin, possible cyanosis.

EFFECTS OF CHRONIC EXPOSURE Bronchial irritation, possible gastrointestinal disturbances, erosion of teeth and jaw necrosis.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - give milk of magnesia, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Hydrogen Fluoride, Perchloric Acid, (Perchloric Acid and Chloroform), Potassium, Propargyl Alcohol, Sodium, Water (Water and Organic Matter).

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Add soda ash to spill. Add Water.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION Full protection

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

Neoprene

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

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-328-5704 Picoline

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 <u>Methyl Pyridine</u>	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS <u>α Picoline</u>	FORMULA <u>C₆H₅NCH₃</u>

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			790		rat	
<u>Note:</u>			674		mouse	
<u>Lowest published lethal concentration in air</u>				410	rabbit	
<u>inhalation - rat 4000 BPM</u>			900		guinea pig	
				see note		

SECTION III PHYSICAL DATA		MW - 92.13
BOILING POINT <u>129⁰C</u>	° F.	VAPOR PRESSURE <u>at 24⁰C</u> 10 mm Hg.
MELTING POINT <u>-70⁰C</u>	° F.	VAPOR DENSITY (Air = 1) <u>3.2</u>
SPECIFIC GRAVITY (H ₂ O = 1) <u>0.95</u>		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O <u>very soluble</u>		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR <u>colorless liquid with unpleasant odor</u>		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT <u>102</u>	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED <u>O.C.</u>		LOWER
EXTINGUISHING MEDIA <u>Alcohol foam, carbon dioxide, dry chemical</u>		

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

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Picoline

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

EFFECTS OF CHRONIC EXPOSURE

Occasional vomiting and diarrhea; weight loss and anemia;
ocular and facial paralysis.

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - induce vomiting, get medical aid; inhalation -
artificial respiration and oxygen as necessary; wash from 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

Outside storage preferred, store inside in a flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-328-5804 B-Picoline

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 Methylpyridine	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 3 - Picoline	FORMULA C_5H_7N

543

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 143°C.	VAPOR PRESSURE mm Hg.
MELTING POINT	VAPOR DENSITY (Air = 1) 3.21
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 Colorless liquid, with unpleasant odor.	

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 goggles and self-contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

B-Picoline

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, dizziness, vomiting.

EFFECTS OF CHRONIC EXPOSURE

Occasional vomiting and diarrhea; weight loss and anemia;
ocular and facial paralysis.EMERGENCY AND FIRST AID PROCEDURES If swallowed - induce vomiting, get medical aid; inhalation -
artificial respiration and oxygen as needed; wash from 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

Used 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

Outside storage preferred, store inside in a flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-328-5904
G-Picoline

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 Methyl pyridine	
CHEMICAL NAME AND SYNONYMS	FORMULA
4 Picoline	$C_6H_7NCH_3$

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.
			1290		rat	
Note:				270	rabbit	
Lowest published lethal concentration in air						
inhalation - rat 1000 PPM - 4 hrs.				See Note		

SECTION III PHYSICAL DATA MW - 93.12

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
143			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
3.7°C		3.21	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.96			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
∞			
APPEARANCE AND ODOR			
colorless liquid with unpleasant odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
134°F		
METHOD USED		LOWER
O.C.		

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
G-Picoline

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.

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

EMERGENCY AND FIRST AID PROCEDURES If swallowed - induce vomiting, get medical aid; inhalation - artificial respiration and oxygen as needed; wash from 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
Use in hood	Goggles
MECHANICAL (GENERAL)	GLOVES
	Rubber
SPECIAL	RESPIRATOR
	Self-contained
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Outside storage preferred, store inside in a flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

<p align="center">PRODUCT DESIGNATION</p> <p>03-203-2504 Picramic Acid</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
2 amino-4,6 Dinitro Phenol	$(\text{NH}_2)(\text{OH})\text{C}_6\text{H}_2(\text{NO}_2)_2$

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

SECTION III PHYSICAL DATA		MW - 199.13
BOILING POINT	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
169°C		
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
Soluble		
APPEARANCE AND ODOR		
Red crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT	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 operation.
UNUSUAL FIRE AND EXPLOSION HAZARDS
Severe explosion hazard

PRODUCT DESIGNATION

Picramic Acid

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, weakness, cyanosis, respiratory distress.

EFFECTS OF CHRONIC EXPOSURE

Weight loss, anemia, possible liver damage, dermatitis

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - give epsom salt solution, 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)

Explosive (keep from 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

Keep away from oxidizing materials, combustables and sources of heat.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-328-6204
Picramide

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

2,4,6 Trinitroaniline

FORMULA

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

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 - 228.12

BOILING POINT

° F.

explodes

VAPOR PRESSURE

mm Hg.

MELTING POINT

° F.

190°C

VAPOR DENSITY (Air = 1)

SPECIFIC GRAVITY (H₂O - 1)

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

insoluble

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

yellow monoclinic 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

Picramide

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

REVELANT 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

03-328-6404
Picryl 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

2,4,6 Trinitrochlorobenzene

FORMULA

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

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 - 247.56

BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 83°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.80		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR yellow monoclinic			

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

Picryl Chloride

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

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

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 Potassium Arsenate 03-110-0452

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 Potassium Arsenate	FORMULA KH_2AsO_4

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1140		rat	

SECTION III PHYSICAL DATA		MW - 180.02
BOILING POINT ° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 288°C.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 2.867	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 available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA None available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Potassium Arsenate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 0.25 mg/m³

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Ingestion or inhalation of dust or fume.

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Acute pulmonary edema, restlessness, dyspnea, cyanosis. If ingested - gastroenteritis, vomiting, diarrhea, drop in blood pressure.

EFFECTS OF CHRONIC EXPOSURE Optic neuritis, anesthesia, edema and dermatitis, anemia, loss of weight, nausea, salivation.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if ingested - give emetic (antidote - dimer caprol) - obtain 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 or goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

With particulate 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>03-110-0802 Potassium Bichromate</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 Neutral potassium chromate, Potassium Chromate VI	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Potassium dichromate	FORMULA $K_2Cr_2O_7$

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			See Note 1			
Oral - human 430/kg.						

SECTION III PHYSICAL DATA	
BOILING POINT d 500 ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 398 ° C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.676	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 4.9	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR red crystals	

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

EXTINGUISHING MEDIA Water
SPECIAL FIRE FIGHTING PROCEDURES Material may form hot viscous foam. Possible steam explosion.
UNUSUAL FIRE AND EXPLOSION HAZARDS Furnishes oxygen - container may explode in fire.

PRODUCT DESIGNATION
Potassium Bichromate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 0.15 mg/m³ CARCINOGENIC yes

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust by mouth. SKIN AND EYE
IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE Irritation of skin and eyes, irritation of respiratory tract,
internal irritation and damage.

EFFECTS OF CHRONIC EXPOSURE Asthmatic symptoms - liver and kidney damage; lung cancer.

EMERGENCY AND FIRST AID PROCEDURES Wash from skin and eyes; if swallowed - wash mouth, give
emetic, get medical attention; inhalation - rest and keep warm.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
Powerful oxidizing agent.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) May react with organic materials to produce a fire
(acetic acid, acetic anhydride, anthracene, ethyl alcohol)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Cover with weak reducing agent such as sodium bisulfite. Transfer slurry
to large water container for disposal.

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 place away from easily oxidizable substances.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-110-1032
Potassium Bifluoride

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 Potassium acid fluoride	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Potassium difluoride	FORMULA

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			See Note 1 & 2			
Oral - guinea pig 150 mg/kg.						
#2 Lowest published lethal dose						
Subcutaneous - guinea pig 250 mg/kg.						

SECTION III PHYSICAL DATA MW - 78.11

BOILING POINT ° 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 41 at 21°C.	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

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing and respirator.

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

PRODUCT DESIGNATION	
Potassium Bifluoride	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL	CARCINOGENIC
TLV - 3 PPM (for HF)	no
PRINCIPLE ROUTES OF ABSORPTION	SKIN AND EYE
Inhalation of HF, skin absorption	IRRITATION Severe
RELEVANT SYMPTOMS OF EXPOSURE	
Irritation of respiratory system, skin absorption and eye burns.	
EFFECTS OF CHRONIC EXPOSURE	
Weight loss, brittleness of bones, anemia, weakness, discoloration of teeth.	
EMERGENCY AND FIRST AID PROCEDURES	
Inhalation - rest, give oxygen if necessary, get medical attention; wash from skin and eyes, get medical attention; if swallowed - wash mouth, drink water, then milk of magnesia, 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
	Goggles
MECHANICAL (GENERAL)	GLOVES
	Rubber gloves
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

03-110-2902
Potassium Chromate

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 Potassium Chromate	FORMULA K_2CrO_4

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 oral - human 430 mg/kg.			See notes 1 and 2			
#2 - lowest published lethal dose subcutaneous - rabbit 12 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT --	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 975	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.732		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 58		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellow crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA
Water

SPECIAL FIRE FIGHTING PROCEDURES

Material will form hot viscous foam. Possible steam explosion.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Furnishes oxygen. Container may explode in a fire.

PRODUCT DESIGNATION
Potassium Chromate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 0.19 mg/m³

CARCINOGENIC yes

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust (mainly) ingestion

SKIN AND EYE
IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE Irritation of skin and eyes, irritation of respiratory tract,
internal irritation and damage.

EFFECTS OF CHRONIC EXPOSURE
Asthmatic symptoms - liver and kidney damage, lung cancer.

EMERGENCY AND FIRST AID PROCEDURES Wash from skin and eyes; if swallowed - wash mouth, give
emetic, get medical attention; inhalation - rest, keep warm.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY
Powerful oxidizing agent.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) May react with organic materials to produce a fire.
(Acetic anhydride, acetic acid, anthracene, ethyl 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 Face shield
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 03-110-3532 03-110-3502 Potassium Cyanide

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 Potassium Cyanide	FORMULA KCN

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.
			10		Rat	
				6	Mouse	

SECTION III PHYSICAL DATA			
BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 634.5°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.52		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 122.2 in hot water	soluble	VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR White crystals			

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT Non-combustible	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		

EXTINGUISHING MEDIA None available

SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.
--

UNUSUAL FIRE AND EXPLOSION HAZARDS Releases HCN with water or acids.

PRODUCT DESIGNATION
Potassium Cyanide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of HCn, skin and ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Giddiness, dizziness, rapid heart action followed by unconsciousness; if swallowed - rapid respiration - becoming slow - unconsciousness and death.

EFFECTS OF CHRONIC EXPOSURE Dizziness, weakness, congestion of lungs, loss of appetite, loss of weight.

EMERGENCY AND FIRST AID PROCEDURES If inhaled - breathe amyl nitrate; if swallowed - breath amyl nitrate, wash from eyes or skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Avoid acids.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Sweep with broom onto a sheet of paper. Ready for disposal.

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

Overalls and aprons.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry place away from acids or oxidizing materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-110-4522 Potassium Fluoride

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 Potassium Fluoride	FORMULA KF

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

SECTION III PHYSICAL DATA		MW - 58.10
BOILING POINT 880°C	° F.	VAPOR PRESSURE 1 mm at 885°C
MELTING POINT 1500°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.48		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 92.3 at 18°C.		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White solid		

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

EXTINGUISHING MEDIA Water

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Potassium Fluoride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
2.5 mg/m³

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust, ingestion skin.

SKIN AND EYE
IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE . Irritation of respiratory system; severe internal irritation and damage; skin and eye burns.

EFFECTS OF CHRONIC EXPOSURE
Increase in fluoride content of teeth.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, keep warm, get medical aid; if swallowed - wash mouth, drink water, then milk of magnesia, get medial aid, wash from skin and eyes, 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
Sweep into container for disposal.

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

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store away from contacts with acids.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

Potassium Hydroxide
03-110-5042

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

Potassium Hydroxide

FORMULA

KOH

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 56.11

BOILING POINT 1320-1324°C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 360	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 2.044		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR White			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Flood with water

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing - do not splash or splatter material.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Potassium Hydroxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

2 mg/m³ ceiling valueneoplastic
CARCINOGENIC effects

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust or mist, ingestion.

SKIN AND EYE

IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE

Corrosive action on skin, eyes and mucous membranes = If
ingested - severe pain, vomiting, diarrhea and collapse.

EFFECTS OF CHRONIC EXPOSURE

Chronic dermatitis.

EMERGENCY AND FIRST AID PROCEDURES

Wash from skin; Ingestion; give milk or fruit juice to
drink - obtain medical help.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Acetic Acid, Maleic Anhydride, Nitropropane, Phosphorous,
Trichloroethylene.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

w/appropriate filter

OTHER PROTECTIVE EQUIPMENT

Rubber apron and full face shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in dry place; protect against moisture and water. Separate from acids,
metals, explosives, organic peroxides, and easily ignitable materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-110-5602 Potassium 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 Potassium, Kalium	FORMULA K

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 - 39.10
BOILING POINT 774°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 3.65°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 0.86		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O R		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Silver metal		

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

EXTINGUISHING MEDIA Use metal "X" extinguisher.
--

SPECIAL FIRE FIGHTING PROCEDURES Smother fire with powder (no water).
--

UNUSUAL FIRE AND EXPLOSION HAZARDS Explosive action with water, forms KO ₂ or K ₂ O ₄ (yellow) with oxygen which explodes on contact with organics.

PRODUCT DESIGNATION
Potassium Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available (2 mg/C.M. KOH) CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of smoke ingestion. SKIN AND EYE
IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Swallowing - from KOH, swallowing painful and difficult burning
pain down from esophagus to stomach, pulse rapid and feeble, irritation of skin.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES Wash mouth, dilute alkali by drinking water, then give
olive oil, milk or egg white; if on skin - remove bulk before water washing with
large quantities of water. Get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY Reacts violently with water, potassium with KO_2 (yellow)
reacts explosively with water or organic liquids.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Fluorocarbons, halogens, air, oxygen, potassium nitrate,
water, potassium superoxide, chlorinated hydrocarbons.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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

Face shield with protective clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store under kerosens or mineral oil. Keep away from water.

OTHER PRECAUTIONS

SIGNATURE

DATE

03-110-6402
Potassium Oxalate

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

Potassium Oxalate

$$\frac{\text{K}_2\text{CO}_3 \cdot \text{H}_2\text{O}}{2 \quad 2 \quad 4 \quad 2}$$

SECTION II HAZARDOUS INGREDIENTS

[illegible]

SECTION III PHYSICAL DATA

BOILING POINT

0 F

VAPOR PRESSURE

mm Hg.

MELTING POINT

0 F

VAPOR DENSITY (Air = 1)	3.4
-------------------------	-----

SPECIFIC GRAVITY (H₂O = 1)

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

2.13

SOLUBILITY IN WATER		Pts/100 pts H ₂ O
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30
31	31	31
32	32	32
33	33	33
34	34	34
35	35	35
36	36	36
37	37	37
38	38	38
39	39	39
40	40	40
41	41	41
42	42	42
43	43	43
44	44	44
45	45	45
46	46	46
47	47	47
48	48	48
49	49	49
50	50	50
51	51	51
52	52	52
53	53	53
54	54	54
55	55	55
56	56	56
57	57	57
58	58	58
59	59	59
60	60	60
61	61	61
62	62	62
63	63	63
64	64	64
65	65	65
66	66	66
67	67	67
68	68	68
69	69	69
70	70	70
71	71	71
72	72	72
73	73	73
74	74	74
75	75	75
76	76	76
77	77	77
78	78	78
79	79	79
80	80	80
81	81	81
82	82	82
83	83	83
84	84	84
85	85	85
86	86	86
87	87	87
88	88	88
89	89	89
90	90	90
91	91	91
92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

VOLATILE

% Vol.

% Wt.

28.7

APPEARANCE AND ODOR

White crystal

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

N/A

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

METHOD USED

N/A

LOWER

EXTINGUISHING MEDIA

N/A

SPECIAL FIRE FIGHTING PROCEDURES

N/A.

UNUSUAL FIRE AND EXPLOSION HAZARDS

When heated to decomposition temperature may emit toxic fumes.

PRODUCT DESIGNATION
Potassium Oxalate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 1 mg/C.M. (Oxalic Acid)

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Ingestion

SKIN AND EYE
IRRITATION Yes

RELEVANT SYMPTOMS OF EXPOSURE If swallowed - severe internal pain, collapse,
kidney damage.

EFFECTS OF CHRONIC EXPOSURE May produce calcium oxalate crystals in bladder.

EMERGENCY AND FIRST AID PROCEDURES Skin or eye - flush with water. If swallowed, wash
out mouth, and give salt water to induce vomiting, get medical attention.

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
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

PRODUCT DESIGNATION

03-110-6802
Potassium Periodate

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

Potassium Periodate

KIO₄

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 at 300°C.	mm Hg.
MELTING POINT 582°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 3.618 at 15°C.		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.66 at 13°C.		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 N/A		LOWER
EXTINGUISHING MEDIA		

N/A

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

PRODUCT DESIGNATION

Potassium Periodate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC

No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust, ingestion

SKIN AND EYE

IRRITATION ModerateREVELANT SYMPTOMS OF EXPOSURE Irritation of respiratory system; eye irritation,internal irritation.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, get medical attention; wash from eyes;
if swallowed - wash mouth, induce vomiting, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

Strong oxidizing agent.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

Reducing 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

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

PRODUCT DESIGNATION 03-242-5606 Di-Iso-Propanolamine

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE	
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)	

TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Di-2-Propanolamine	FORMULA (C ₃ H ₇ OH) ₂ NH

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 - 133.19
BOILING POINT 249°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 42°C	° F.	VAPOR DENSITY (Air = 1) 4.59
SPECIFIC GRAVITY (H ₂ O = 1) 0.99		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 260°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Di-Iso-propanolamine

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 skin burns, nausea, headache, respiratory tract irritation, lung edema

EFFECTS OF CHRONIC EXPOSURE
Weight loss, clouding of cornea

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE goggles
MECHANICAL (GENERAL)	GLOVES rubber
SPECIAL	RESPIRATOR with proper filter
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-329-0305
Propionyl 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 Propionyl Chloride	FORMULA $\text{CH}_3\text{CH}_2\text{COCl}$

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 - 92.5

BOILING POINT 80°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -94°C	° F.	VAPOR DENSITY (Air = 1) 3.2
SPECIFIC GRAVITY (H ₂ O = 1) 1.07		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 54°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Propionyl 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 and skin.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

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

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

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

<p align="center">PRODUCT DESIGNATION</p> <p>03-208-8702</p> <p>N-Propyl Alcohol</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
1 Propanol	
CHEMICAL NAME AND SYNONYMS	FORMULA
N Propyl Alcohol	C ₃ H ₇ OH

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1870		Rat	
				See Note		
Note:						
Lowest published lethal dose						
Oral - human - 5700 mg/Kg.						

SECTION III PHYSICAL DATA		MW - 60.1
BOILING POINT	° F.	VAPOR PRESSURE
97°C		at 15°C
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
127°C		2.1
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)
0.80		
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE
		% Vol.
		% Wt.
APPEARANCE AND ODOR		
Clear colorless liquid, alcohol-like odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT	FLAMMABLE (EXPLOSIVE)	UPPER
59°F		13.5%
METHOD USED	LIMITS	LOWER
CC		2.1%
EXTINGUISHING MEDIA		
Alcohol foam, carbon dioxide, dry chemical - water may be ineffective.		

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

N-Propyl alcohol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 200 PPM, 500 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION LOW

RELEVANT SYMPTOMS OF EXPOSURE

Mild narcotic effect, slight lowering of blood pressure, feeling of warmth

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - induce vomiting, get medical aid, gastric lavage; 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 03-242-6106 Di-Iso-Propylamine

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE	
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)	

TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Di Isopropylamine	FORMULA (C ₃ H ₇) ₂ NH

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.
			703		rat	
				see note		
Lowest published lethal concentration in air						
inhalation - rat - 1000 PPM - 4 hours						

SECTION III PHYSICAL DATA			MW - 101.22	
BOILING POINT 84°C	° F.	VAPOR PRESSURE	mm Hg.	
MELTING POINT -61°C	° F.	VAPOR DENSITY (Air = 1)	3.5	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)		
0.722				
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol.	% Wt.
soluble				
APPEARANCE AND ODOR Colorless liquid, with fishy odor				

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 30°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER
EXTINGUISHING MEDIA alcohol foam, carbon dioxide, dry chemical		

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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Di-Iso-Propylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

5 PPM, 20 mg/C.M. Skin

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE

IRRITATION

severe

RELEVANT SYMPTOMS OF EXPOSURE

respiratory tract irritation, lung edema, skin & eye burns,

EFFECTS OF CHRONIC EXPOSURE

~~nausea, headache.~~

clouding of cornea

EMERGENCY AND FIRST AID PROCEDURES

inhalation - rest; if swallowed - drink water, get medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

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 or detached storage is preferable-inside storage should be in a standard flammable liquid storage room or cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-242-6206
Di-N-propyl amine

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)	
TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Di-Propylamine	FORMULA (C ₃ H ₇) ₂ NH

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.
			930		rat	
			1250		rabbit	
			See Note			
Lowest published lethal concentrations in air						
inhalation - rat 1000 PPM - 4 hours						

SECTION III PHYSICAL DATA MW - 101.22

BOILING POINT 105°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -40°C	° F.	VAPOR DENSITY (Air = 1) 3.5
SPECIFIC GRAVITY (H ₂ O = 1) 0.74		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR water white, fishy odor		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 63°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

PRODUCT DESIGNATION

Di-N-propylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion (mainly)

SKIN AND EYE

IRRITATION

severe

RELEVANT SYMPTOMS OF EXPOSURE respiratory tract irritation, lung edema, eye & skin

burns, nausea, headache.

EFFECTS OF CHRONIC EXPOSURE

Weight loss, clouding of cornea.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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 or detached storage is preferable-inside storage should be in a standard flammable liquid storage room or cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-329-1905 N-Propylamine</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 1 Aminopropane	FORMULA <chem>C3H7NH2</chem>

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.
					rat	2310
				560	rabbit	

SECTION III PHYSICAL DATA	
BOILING POINT °F. 49°C MELTING POINT °F. -83°C SPECIFIC GRAVITY (H ₂ O = 1) 0.72 SOLUBILITY IN WATER Pts/100 pts H ₂ O infinite APPEARANCE AND ODOR colorless liquid, strong ammonia odor.	MW - 59.13 VAPOR PRESSURE at 20°C 248 mm Hg. VAPOR DENSITY (Air = 1) 1.7 EVAPORATION RATE (_____ = 1) VOLATILE % Vol. % Wt.

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT -35°F METHOD USED	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 10.4% LOWER 2.0%
EXTINGUISHING MEDIA carbon dioxide, dry chemical, alcohol foam. Water may be ineffective.		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
N-Propylamine

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
nose and throat irritation, lung edema, skin & eye burns.

EFFECTS OF CHRONIC EXPOSURE

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

with proper filter

OTHER PROTECTIVE EQUIPMENT

Face shield, rubber apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Protect against physical damage - outside or detached storage preferred. Inside storage
in a standard flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-329-2305
N-Propylaniline

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)	
TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS N Propylaniline	FORMULA $C_3H_7NHC_6H_5$

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 - 135.20

BOILING POINT 222°C.	° F.	VAPOR PRESSURE at 87°C	mm Hg. 5
MELTING POINT	° 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

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-Propylaniline

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 03-242-6606 N,N-Di-N-Propylaniline

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE	
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)	

TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS	FORMULA
N,N-Dipropylaniline	$C_9H_{11}N(CH_2CH_2CH_3)_2$

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 - 177.28
BOILING POINT 245°C	° F.	VAPOR PRESSURE at 177°C
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 0.91		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR yellow oil		

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

EXTINGUISHING MEDIA alcohol foam, carbon dioxide, water spray, dry chemical
--

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

N,N-Di-N-Propylaniline

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, drowsiness, cyanosis, mental confusion, convulsions.

EFFECTS OF CHRONIC EXPOSURE

Fatigue, loss of appetite, headache, dizziness

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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

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 03-242-7106 Di-N-propylcarbinol
--

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE	
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (NUMBER, STREET, CITY, STATE, ZIP CODE)	
TRADE NAME AND SYNONYMS	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS	FORMULA
Heptanol 4	(C ₇ H ₁₆) CHOH

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
156°C	
MELTING POINT	VAPOR DENSITY (Air = 1)
-37°C	
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)
0.82	
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
none available		
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
Di-N-propylcarbinol

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 Twitching, narcosis, weakness, tremors, convulsions, eye irritation.

EFFECTS OF CHRONIC EXPOSURE liver damage

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE 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

03-329-3305
N-Propylbenzene

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 propane

FORMULA

$C_6H_5C_3H_7$

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.
			4830		rat	

SECTION III PHYSICAL DATA

BOILING POINT 159.2 °F.	VAPOR PRESSURE at 43.4 °C	MW - 120.19	10 mm Hg.
MELTING POINT -99.5 °C	VAPOR DENSITY (Air = 1) 4.14		
SPECIFIC GRAVITY (H ₂ O = 1) 0.862	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 86 °F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER
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
N-Propylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	not available	CARCINOGENIC	no
PRINCIPLE ROUTES OF ABSORPTION	inhalation, ingestion, skin	SKIN AND EYE IRRITATION	moderate
RELEVANT SYMPTOMS OF EXPOSURE	Skin and eye irritant, 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 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 03-329-4405 N-Propyl 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 Propyl Chloroformate	FORMULA <chem>ClCOOC3H7</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 - 122.55
BOILING POINT 115°C	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.10		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
METHOD USED		LOWER

EXTINGUISHING MEDIA carbon dioxide, dry chemical.
--

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
N-Propyl 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

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
Keep away from water.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-329-4805
Propylene 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

Propylene dibromide

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

1,2 dibromopropane

FORMULA

$\text{CH}_2\text{BrCHBrCH}_3$

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 - 201.9

BOILING POINT 140°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -55°C	° F.	VAPOR DENSITY (Air = 1)	7.0
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.94			
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
N/A		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

Propylene Bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

not available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION

moderate

RELEVANT SYMPTOMS OF EXPOSURE

Eye irritation, narcosis, drowsiness, headache, vomiting.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, 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

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

03-329- 4905
Propylene 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

1 Bromo 2 Propanol

 $\text{BrCH}_2\text{CHOHCH}_3$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 139.0

BOILING POINT 148°C.	° F.	VAPOR PRESSURE at 52°C.	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	16
SPECIFIC GRAVITY (H ₂ O = 1)		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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Propylene Bromohydrin

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

Eye and nasal irritation, nausea, vomiting, giddiness, dizziness, incoordination, visual disturbances, coma.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Wash skin & eyes; 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 03-329-5105 Propylene 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 Propylene dichloride	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 1,2 dichloropropane	FORMULA <chem>CH2ClCHClCH3</chem>

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			1900		rat	
			860		mouse	

SECTION III PHYSICAL DATA		MW - 112.99
BOILING POINT 96.8°C	° F.	VAPOR PRESSURE at 25°C
MELTING POINT -100°C	° F.	VAPOR DENSITY (Air = 1) 3.9
SPECIFIC GRAVITY (H ₂ O = 1) 1.159		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.27		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR Colorless liquid, chloroform-like odor.
--

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 60°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER

EXTINGUISHING MEDIA Foam, carbon dioxide, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES Water may be ineffective.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Propylene Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 75 PPM, 350 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE Eye irritation, narcosis, sleepiness, headache, vomiting.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, 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

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

CA - 000127004

PRODUCT DESIGNATION

03-329-5205
Propylene ChlorohydrinMATERIAL SAFETY
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 Propanol

FORMULA

 $\text{ClCH}_2\text{CHOHCH}_3$

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.
				480	rabbit	

SECTION III PHYSICAL DATA

BOILING POINT 127°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1) 3.26
SPECIFIC GRAVITY (H ₂ O = 1) 1.10		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O infinitely soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid, mild nonresidual odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Propylene Chlorohydrin

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 nasal irritation, nausea, vomiting, giddiness, dizziness, incoordination, visual disturbances, coma.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Wash skin & eyes; 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 03-329-5595 03-329-5605 Propylene 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 1,2, Propanediol	FORMULA CH ₃ CHOHCH ₂ 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.
			21		rat	
				22	rat	
			24		mouse	
			22		dog	
			18		rabbit	
			19		guinea pig	

SECTION III PHYSICAL DATA			MW - 76.11
BOILING POINT 187°C	° F.	VAPOR PRESSURE at 20°C	mm Hg. 0.08
MELTING POINT	° 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 infinite		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR colorless liquid, practically odorless.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 210°	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 12.5% LOWER 2.6%
METHOD USED open cup		
EXTINGUISHING MEDIA Alcohol foam, carbon dioxide, dry chemical.		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Propylene Glycol

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 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; 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

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-329-5805
Propylene Oxide

MATERIAL SAFETY DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

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

TRADE NAME AND SYNONYMS

1,2-Epoxypropane

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Propylene Oxide

FORMULA

 $\text{CH}_3\text{CHOCH}_2$

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.
			1140		rat	
					mouse	1740
				1500	rabbit	
					guinea pig	
			690			

SECTION III PHYSICAL DATA MW - 58.08

BOILING POINT 34°C	° F.	VAPOR PRESSURE 18°C	400 mm Hg.
MELTING POINT -104°C	° F.	VAPOR DENSITY (Air = 1) 2.0	
SPECIFIC GRAVITY (H ₂ O = 1) 0.83		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 33		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR colorless liquid with ether-like odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

SECTION IV - FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT -35°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 21.5%
METHOD USED TOC		LOWER 2.1%
EXTINGUISHING MEDIA Carbon dioxide, dry chemical, alcohol foam -		

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

May react vigorously with oxidizing materials.

PRODUCT DESIGNATION
Propylene Oxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 100 PPM, 240 mg/C.M. CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE
Ingestion, inhalation IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE Irritation of eyes, upper respiratory tract and lungs; skin
irritation and corneal burns; periodic vomiting.

EFFECTS OF CHRONIC EXPOSURE
Lung damage.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - get medical aid; inhalation - artificial
respiration if needed; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION May polymerize with heat evolution in
contact with catalyst.

INCOMPATIBILITY (MATERIALS TO AVOID) Anhydrous chlorides of Fe, Sn, Al; Peroxides of Fe
and Al; alkali metal 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

MECHANICAL (GENERAL) Goggles

SPECIAL GLOVES

RESPIRATOR Rubber

OTHER PROTECTIVE EQUIPMENT Self-contained

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Detached outside storage is preferred. Inside storage in standard flammable liquids
storage cabinet. Isolate from combustible materials.

OTHER PRECAUTIONS

SIGNATURE DATE

CAS - 000110861

PRODUCT DESIGNATION

Pyridine
03-731-8305MATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

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

TRADE NAME AND SYNONYMS

Azone

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Azabenzene

FORMULA

 C_5H_5N

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.
			891		Rat	
					Rat	4000
				1000	Rat	
				1121	Rabbit	

SECTION III PHYSICAL DATA MW 79.10

BOILING POINT 115.3°C.	° F.	VAPOR PRESSURE at 13.2°C.	10 mm Hg.
MELTING POINT -42°C.	° F.	VAPOR DENSITY (Air = 1) 2.73	
SPECIFIC GRAVITY (H ₂ O = 1) 0.982		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O ∞		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR

Clear liquid with a fishy odor (odor threshold less than 1 PPM)

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 68°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		LOWER

EXTINGUISHING MEDIA

Use alcohol foam, carbon dioxide, or dry chemical. Water may be ineffective.

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Vapor may travel a considerable distance to a source of ignition and flashback.

PRODUCT DESIGNATION
Pyridine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5 PPM, 15 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Narcosis, headache, nausea, giddiness, vomiting
oral - liver and kidney damage, skin irritation.

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

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, artificial respiration and oxygen if needed;
ingestion - wash mouth, give emetic, get medical aid; wash skin and eyes thoroughly.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

A 0.17% solution of pyridine in maleic anhydride at 185°C. gives exothermic decomposition.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 03-341-1906 Quinone
--

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 Chinone	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS P-Benzoquinone	FORMULA C_6H_4O

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:			130		rat	
Lowest published lethal concentration in air				See Note		
inhalation - mouse 320 mg/C.M.						

SECTION III PHYSICAL DATA		MW - 108.09
BOILING POINT sublimes	° F.	VAPOR PRESSURE at 25°C. 0.1 mm Hg.
MELTING POINT 116°C	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.318		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O Very slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellow crystals, pungent odor.		

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

EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Quinone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL 0.1 PPM, 0.4 mg/C.M. CARCINOGENIC no

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

REVELANT SYMPTOMS OF EXPOSURE Irritation and damage to skin & eyes, loss of vision, vomiting, collapse, coma.

EFFECTS OF CHRONIC EXPOSURE
Eye damage, discoloration, severe irritation, swelling.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - give milk, 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

03-348-0607
Resorcinol

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 m dihydroxybenzene		CHEMICAL FAMILY	
CHEMICAL NAME AND SYNONYMS 1,3 Benzene Diol		FORMULA $C_6H_4(OH)_2$	

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.
			301		rat.	

SECTION III PHYSICAL DATA MW - 110.11

BOILING POINT 277°C.	° F.	VAPOR PRESSURE at 108°C.	1 mm Hg.
MELTING POINT 110°C.	° F.	VAPOR DENSITY (Air = 1) 3.79	
SPECIFIC GRAVITY (H ₂ O = 1) 1.285		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 147		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR White crystal that turns pink when exposed to light, unpleasant sweet taste.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 261°F.	FLAMMABLE (EXPLOSIVE) LIMITS.	UPPER
METHOD USED C.C.		LOWER
EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical.		

SPECIAL FIRE FIGHTING PROCEDURES.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Resorcinol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 10 PPM, 45 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, skin, inhalation of dust.

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE Hyperemia, itching, dermatitis, restlessness, cyanosis, dizziness; tremors, convulsions and death.

EFFECTS OF CHRONIC EXPOSURE

Possible liver, kidney and lung damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash eye 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

03-247-6709
Resorcinol 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

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

M-Methoxyphenol

FORMULA

 $\text{CH}_3\text{OC}_6\text{H}_4\text{OH}$

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 - 124.13

BOILING POINT 244°C	° F.	VAPOR PRESSURE at 115°C	mm Hg.
MELTING POINT -17°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) > 1		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
METHOD USED		LOWER

EXTINGUISHING MEDIA

carbon dioxide, alcohol foam, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Resorcinol monomethyl ether

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion

SKIN AND EYE

IRRITATION

moderateRELEVANT SYMPTOMS OF EXPOSURE hyperemia, itching, dermatitis, restlessness, cyanosis, dizziness, tremors, convulsions, death.

EFFECTS OF CHRONIC EXPOSURE

Possible liver, kidney and lung damage

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - induce vomiting, get medical aid; wash eyes & skin; inhalation - rest.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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 03-121-2905 03-121-2910 Ruthenium 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 Ruthenium Chloride	FORMULA $\text{RuCl}_4 \cdot 2\text{H}_2\text{O}$

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

SECTION III PHYSICAL DATA	
BOILING POINT -- ° 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 Soluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Dark colored powder	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT Will not burn.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Ruthenium 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

Lacrimation, disturbance of vision, headache, eye

irritation, cough.

EFFECTS OF CHRONIC EXPOSURE

Pulmonary edema

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - induce vomiting,
get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

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 Selenium Metal Powder 99% Pure 03-125-4006
--

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 Selenium	FORMULA Se

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 concentration in air						
inhalation - rat 33 mg/C.M.						

SECTION III PHYSICAL DATA	
BOILING POINT 688 ⁰ C.	VAPOR PRESSURE at 356 ⁰ C. 1 mm Hg.
MELTING POINT 170 - 217 ⁰ C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 4.26 - 4.79	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O insoluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR steel grey, non-metallic element.	

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

EXTINGUISHING MEDIA Use water spray.

SPECIAL FIRE FIGHTING PROCEDURES Small fires extinguished with sand. Self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS Same as sulfur. Burning Se produces SeO ₂ .
--

PRODUCT DESIGNATION
Selenium Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV 0.2 mg/m³

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust, ingestion

SKIN AND EYE
IRRITATION Slight

REVELANT SYMPTOMS OF EXPOSURE
Nervousness, fear, vomiting, difficult respiration, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE
Possible liver damage, nervousness, tremor, metallic taste, garlic-like odor
of breath.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, oxygen as needed; if swallowed - give
emetic, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Barium Carbide, Bromine Pentafluoride, Calcium Carbide,
Chromium Trioxide, Fluorene, Lithium, Silicide, Nickel, Nitric Acid, Nitrogen

HAZARDOUS DECOMPOSITION PRODUCTS Trichloride.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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
Plastic or rubber

SPECIAL

RESPIRATOR
With proper filter

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in place free from water.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-357-1708 Semicarbazide 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 Semicarbazide Hydrochloride	FORMULA $\text{NH}_2\text{COH}_2\text{N} \cdot \text{HCl}$

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 - 111.54
BOILING POINT ° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 173°C.D.	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 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

Semicarbazide Hydrochloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Irritation of skin, eyes and mucous membranes, gastroenteric disturbances, anemia

EFFECTS OF CHRONIC EXPOSURE

Blood and liver damage, loss of appetite.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash from 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 Sodium Arsenite 03-131-1068
--

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 Sodium Metaarsenite	FORMULA Na AsO 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.
			41		rat	
				10	mouse	

SECTION III PHYSICAL DATA MW 129.91			
BOILING POINT --	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT --	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER 1.87 Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Colorless or grayish-white powder.			

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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Sodium Arsenite

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 0.25 mg/m³ CARCINOGENIC no

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

REVELANT SYMPTOMS OF EXPOSURE
Acute pulmonary edema, restlessness, dyspnea, cyanosis.
If ingested - gastroenteritis, vomiting, drop in blood pressure.

EFFECTS OF CHRONIC EXPOSURE
Optic neuritis, anesthesia, edema and dermatitis, anemia, loss of weight, nausea, salivation.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if ingested give emetic; (antidote - dimercaprol). 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
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 03-131-1108 Sodium Azide

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 Sodium Azide	FORMULA NaN ₃
--	-----------------------------

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 Notes			
oral - rat 46 mg/kg.						
subcutaneous - rat 35 mg/kg.						

SECTION III PHYSICAL DATA MW - 65.02

BOILING POINT ° F. decomp. in vacuum	VAPOR PRESSURE mm Hg.
MELTING POINT ° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.85	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 39	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless, hexagonal 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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Sodium Azide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.1 PPM, 0.3 Mg/K.m. (ceiling value) CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION SKIN AND EYE
Inhalation, ingestion IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE Dizziness, weakness, blurred vision, shortness of
breath, eye irritation.

EFFECTS OF CHRONIC EXPOSURE
May lower blood pressure.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID) May react violently with bromine, carbon disulfide
dibromomalononitrile, and dimethyl sulfate.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 goggles
SPECIAL	GLOVES
OTHER PROTECTIVE EQUIPMENT	RESPIRATOR
	With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION
03-131-3158
03-131-3168
Sodium Calcium Hydrate

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 Soda lime	FORMULA --

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
CaO+ (5-20% NaOH)			not available			

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 White granules	

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

PRODUCT DESIGNATION

Sodium Calcium Hydrate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 2 mg/C.M. (from NaOH)

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Ingestion

SKIN AND EYE

IRRITATION

Yes

REVELANT SYMPTOMS OF EXPOSURE Severe irritation of skin and eyes, severe internal irritation and damage, vomiting, diarrhea and collapse.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES Flush with water and vinegar; if swallowed, wash mouth and give water to drink, then vinegar, get medical attention.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

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 Sodium Chromate 03-131-3608
--

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 Sodium Chromate	FORMULA Na_2CrO_4

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 - rat 243 mg/kg.			See Note			

SECTION III PHYSICAL DATA		MW - 162.0
BOILING POINT	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 792	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.723		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 32		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellow crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT Not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Water		

SPECIAL FIRE FIGHTING PROCEDURES Material may form hot viscous foam. Possible steam explosion.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Source of oxygen (container may explode in fire).

PRODUCT DESIGNATION
Sodium Chromate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.1 mg/C.M. CARCINOGENIC Yes

PRINCIPLE ROUTES OF ABSORPTION Inhalation of dust (mainly) ingestion SKIN AND EYE IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE Irritation of respiratory tract; internal irritation and damage; irritation of skin and eyes.

EFFECTS OF CHRONIC EXPOSURE Asthmatic symptoms; liver and kidney damage, lung cancer.

EMERGENCY AND FIRST AID PROCEDURES If inhaled - 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 Powerful oxidizing agent.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID) May react with organic materials to produce a fire (acetic acid, acetic anhydride, anthracene and ethyl 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 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
-----------	------

PRODUCT DESIGNATION Sodium Cyanide 03-131-4008

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 Sodium Cyanide	FORMULA NaCN

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.
			6440		rat	
#1 lowest published lethal dose						
subcutaneous - mouse 10 mg/kg						
subcutaneous - rabbit 2.2 mg/kg						

SECTION III PHYSICAL DATA		MW 49.02
BOILING POINT 1496°C.	° F.	VAPOR PRESSURE at 817°C. 1 mm Hg.
MELTING POINT 563.7°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.86		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White solid in form of granules, flakes, or eggs.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT not combustible	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Water		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS In contact with acids releases highly flammable hydrogen cyanide gas.		

PRODUCT DESIGNATION
Sodium Cyanide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 5 mg/m³

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation of dust, ingestion, skin

IRRITATION Moderate to severe

REVELANT SYMPTOMS OF EXPOSURE Giddiness, dizziness, rapid heart action, shortness of breath, drop in blood pressure.

EFFECTS OF CHRONIC EXPOSURE Possible dizziness, weakness, congestion of lungs, hoarseness, loss of appetite, loss of weight.

EMERGENCY AND FIRST AID PROCEDURES Give amyl nitrate inhalation, 0.2 ml 3 min. - give artificial respiration with 100% oxygen to maintain high blood oxygen tension - wash skin and eyes - obtain medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Nitrates, nitrites

HAZARDOUS DECOMPOSITION PRODUCTS

In contact with acids, releases HCN gas.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Collect by sweeping with a broom on to a sheet of paper.

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
Goggles

MECHANICAL (GENERAL)

GLOVES
Rubber

SPECIAL

RESPIRATOR
W/appropriate filter

OTHER PROTECTIVE EQUIPMENT

Rubber apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, dry place separated from acids and oxidizing materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION Sodium Dichromate 03-131-4108 03-131-4138

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 Sodium Acid Chromate	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Sodium Bichromate	FORMULA $\text{Na}_2\text{Cr}_2\text{O}_7 \cdot 2\text{H}_2\text{O}$

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
#1 Lowest published lethal dose			See Note 1			
Subcutaneous - guinea pig 51 mg/kg.						

SECTION III PHYSICAL DATA		MW - 298.00
BOILING POINT decomposes 400°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -2H ₂ O at 100°C. anhydrous at 320°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.52		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 238		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Red crystal		

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

EXTINGUISHING MEDIA Water
SPECIAL FIRE FIGHTING PROCEDURES Material may form hot viscous foam. Possible steam explosion.
UNUSUAL FIRE AND EXPLOSION HAZARDS Source of oxygen (container may explode in fire).

PRODUCT DESIGNATION
Sodium Dichromate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.30 mg/C.M. CARCINOGENIC Yes

PRINCIPLE ROUTES OF ABSORPTION Inhalation of dust (mainly) ingestion SKIN AND EYE IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE Irritation of respiratory tract; internal irritation and damage; irritation of skin and eyes.

EFFECTS OF CHRONIC EXPOSURE Asthmatic symptoms, liver and kidney damage, lung cancer.

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 Powerful oxidizing agent.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID) May react with organic materials to produce a fire (acetic anhydride and acid, anthracene, ethyl 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 Safety glasses
--	--

MECHANICAL (GENERAL)	GLOVES Rubber
----------------------	------------------

SPECIAL	RESPIRATOR With proper filter
---------	----------------------------------

OTHER PROTECTIVE EQUIPMENT Protective work clothing.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Keep container away from combustibles and easily oxidized materials.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

PRODUCT DESIGNATION

Sodium Fluoride
03-131-4808
03-131-4848

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

Villiaumite

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Sodium Fluoride

FORMULA

NaF

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 toxic dose			180		Rat	
oral - human 4 mg/kg.						
#2 lowest published lethal dose						
Oral - human 75 mg/kg						
#3 lowest published lethal dose						
oral - guinea pig - 250 mg/kg.						

SECTION III PHYSICAL DATA MW - 41.99

BOILING POINT 1700°C.	° F.	VAPOR PRESSURE 1 mm at 1077°C.	mm Hg.
MELTING POINT 980 - 997°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 2.79		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER 4 Pts/100 pts H ₂ O at 0°C.		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR White powder			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

--

PRODUCT DESIGNATION
Sodium Fluoride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL 2.5 mg/C.M. - TLV CARCINOGENIC no

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

RELEVANT SYMPTOMS OF EXPOSURE Irritation of respiratory system; severe internal irritation and damage; skin and eye burns.

EFFECTS OF CHRONIC EXPOSURE Increase in fluoride content of teeth.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, keep warm; get medical aid; if swallowed - wash mouth, drink water, then milk of magnesia, get medical aid; wash from skin and eyes, 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
Sweep into beaker for disposal.

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 Coveralls	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store away from acid materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-131-5323
Sodium Hydroxide

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

Lye, caustic soda

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Sodium hydroxide

FORMULA

NaOH

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.
			See Note #1			
#1 lowest published lethal dose						
oral - rabbit 500 mg/kg.						

SECTION III PHYSICAL DATA MW 40.01

BOILING POINT 1390°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 318.4°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.13		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 42		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White, deliquescent pellets.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Flood with water

SPECIAL FIRE FIGHTING PROCEDURES

Don't splash or splatter material.

UNUSUAL FIRE AND EXPLOSION HAZARDS

--

PRODUCT DESIGNATION
Sodium Hydroxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 2 mg/m³ (ceiling value) CARCINOGENIC no

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

REVELANT SYMPTOMS OF EXPOSURE Corrosive on skin, eyes and mucous membranes - pulmonary irritation. If ingested - severe pain, vomiting, diarrhea, and collapse.

EFFECTS OF CHRONIC EXPOSURE

Chronic dermatitis

EMERGENCY AND FIRST AID PROCEDURES Ingestion: give milk or fruit juice - obtain medical help; wash skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Acetaldehyde, Acrolein, Acrylonitrile, Allyl Alcohol, Aluminum, Chloronitrotoluenes, Maleic Anhydride, Nitroethane, Nitromethane
HAZARDOUS DECOMPOSITION PRODUCTS

SECTION 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
	W/appropriate filter

OTHER PROTECTIVE EQUIPMENT
Rubber apron and full face shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store in dry place; protect against moisture and water. Separate from acids, metals, explosives, organic peroxides, and easily ignitable materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-131-5508
Sodium Hypochlorite

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 Sodium Hypochlorite	FORMULA Na O Cl

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 - 74.45

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT ° F. decomposes	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 26	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Pale yellow in solution.	

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 Sodium Hypochlorite	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL 1 PPM, 3 Mg/C.M. (Chlorine)	CARCINOGENIC No
PRINCIPLE ROUTES OF ABSORPTION Inhalation, ingestion	SKIN AND EYE IRRITATION Severe
REVELANT SYMPTOMS OF EXPOSURE Skin and eye irritation, upper respiratory tract irritation, pulmonary edema; digestive tract damage.	
EFFECTS OF CHRONIC EXPOSURE --	
EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest; wash from skin & eyes; if swallowed - wash mouth, drink water, get medical aid.	
SECTION VI REACTIVITY DATA	
CONDITIONS CONTRIBUTING TO INSTABILITY	
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION	
INCOMPATIBILITY (MATERIALS TO AVOID) Amines and oxidizable material such as oxalic acid.	
HAZARDOUS DECOMPOSITION PRODUCTS May produce explosive chloramines with amines.	
SECTION VII SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Cover with weak reducing agent such as sodium bisulfite. Transfer slurry into water and dispose of.	
WASTE DISPOSAL METHOD	
SECTION VIII SPECIAL PROTECTION INFORMATION	
VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles
MECHANICAL (GENERAL)	GLOVES Rubber
SPECIAL	RESPIRATOR With proper filter
OTHER PROTECTIVE EQUIPMENT Coveralls	
SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Store in cool, dry place away from combustible materials.	
OTHER PRECAUTIONS	
SIGNATURE	DATE

PRODUCT DESIGNATION 03-131-6028 Sodium 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 Sodium	FORMULA Na

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		
			See	NaOH1		

SECTION III PHYSICAL DATA			
BOILING POINT 892°C.	° F.	VAPOR PRESSURE at 432°C.	AW - 22.997 1 mm Hg.
MELTING POINT 97.8°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.9684		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O reacts		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Silver white metal			

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT Ignites above 115°C. in air	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Dry inert powder such as soda ash or Sodium Chlorate, (no water, CO ₂ or Carbon tetrachloride).		
SPECIAL FIRE FIGHTING PROCEDURES Cover burning sodium with powder to smother fire - use self-contained respirator.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Reacts violently with water to produce hydrogen and sodium hydroxide.		

PRODUCT DESIGNATION
Sodium Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
Not available - TLV (2 mg/C.M. NaOH) CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of smoke ingestion SKIN AND EYE
IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE
Severe skin and eye burns; extreme irritation of nose, throat
and respiratory passages; ingestion - severe pain, vomiting and collapse.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis may follow repeated skin contact with alkalies.

EMERGENCY AND FIRST AID PROCEDURES
Wash from skin with large amounts of water. If swallowed -
dilute by giving water to drink, then fruit juices or diluted vinegar, get medical
aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Reacts violently with water and hydrocarbons

HAZARDOUS DECOMPOSITION PRODUCTS

Sodium Hydroxide

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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 Protective clothing	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Protect from physical damage, keep from water, store under nitrogen,
kerosene or mineral oil.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-131-6908 Sodium Oxalate

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 Sodium Oxalate	FORMULA $\text{Na}_2\text{C}_2\text{O}_4$

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			See Note 1			
Subcutaneous - mouse 100 mg/kg.						

SECTION III PHYSICAL DATA	
BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT decomposes ° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.27 at 20°C.	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 3.7	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 N/A

SPECIAL FIRE FIGHTING PROCEDURES N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS When heated to decomposition temperature may emit toxic fumes.
--

PRODUCT DESIGNATION

Sodium Oxalate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

1 Mg/C.M. (oxalic acid value)

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Ingestion (mainly)

SKIN AND EYE

IRRITATION Yes

REVELANT SYMPTOMS OF EXPOSURE If swallowed - severe internal pain and collapse;
kidney damage.

EFFECTS OF CHRONIC EXPOSURE

May produce calcium oxalate crystals in bladder.

EMERGENCY AND FIRST AID PROCEDURES Skin or eye - flush with water. If swallowed, wash mouth
and give salt water to induce vomiting, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
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 03-131-7338 Sodium Peroxide
--

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
Sodium Peroxide	Na ₂ 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.
			Not available			

SECTION III PHYSICAL DATA		MW - 77.99
BOILING POINT	° F.	VAPOR PRESSURE
--		mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)
d (460°C.)		
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)
2.805		
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol. % Wt.
5		
APPEARANCE AND ODOR		
White powder		

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

SPECIAL FIRE FIGHTING PROCEDURES
Wear full protective clothing.
UNUSUAL FIRE AND EXPLOSION HAZARDS
Reacts with water to produce oxygen.

PRODUCT DESIGNATION

Sodium Peroxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 2 Mg/C.M. (NaOH) (ceiling value)

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion (mainly)

SKIN AND EYE

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Extremely corrosive to skin, eyes and mucous membranes, pulmonary irritation.

EFFECTS OF CHRONIC EXPOSURE

Chronic dermatitis.

EMERGENCY AND FIRST AID PROCEDURES Wash from skin and eyes; if swallowed - wash mouth, drink 1% vinegar, orange juice or lemon juice, get medical aid; if inhaled - rest, keep warm, get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

Strong oxidizing agent.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Reducing agents, water, strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Cover with (9.1) sand to soda ash

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

Store away from sources of water.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-131-8148
03-131-8188
Sodium Silicate

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 Water glass	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Sodium Silicate	FORMULA $\text{Na}_2\text{OXSIO}_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD50		LC50	
			ORAL	PERCUT.	SPECIES	CONC.
			13		Rat	
			7		Mouse	
			2		Rabbit	

SECTION III PHYSICAL DATA

BOILING POINT --	° 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 V.S.		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Clear solution		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Water		
SPECIAL FIRE FIGHTING PROCEDURES		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
Sodium Silicate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 2 Mg/C.M. (NaOH) CARCINOGENIC No

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

REVELANT SYMPTOMS OF EXPOSURE
Extremely corrosive to skin, eyes and mucous membranes;
also pulmonary irritation.

EFFECTS OF CHRONIC EXPOSURE
Chronic dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, keep warm, get medical aid; if swallowed -
wash mouth, drink 1% vinegar, 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)
Strong 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 Face shield
--	---

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>03-131-8758 Sodium Tellurite</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 Disodium Tellorus Acid	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Sodium tellurite	FORMULA Na_2TeO_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.
			20		Mouse	
Note:			83		Rat	
Lowest published lethal dose			67		Rabbit	
Oral - human 29 mg/kg.			45		Guinea Pig	
				See Note		

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) N/A	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR White powder	

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

PRODUCT DESIGNATION
Sodium Tellurite

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL 0.1 Mg/C.M. CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION Inhalation, ingestion SKIN AND EYE IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE Sleepiness, loss of appetite, nausea, metallic taste, garlic odor to breath.

FFECTS OF CHRONIC EXPOSURE Fatigue, loss of appetite, bronchitis, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES If inhaled - 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

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 Stannic Chloride 03-133-3038

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 Tin Tetrachloride	FORMULA SnCl₄ · 5H₂O

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.
				21	mouse	
Note: Intraperitoneal -	mouse LD50 46 mg/kg.			See Note		

SECTION III PHYSICAL DATA	
BOILING POINT 114.1°C.	VAPOR PRESSURE at 10°C.
MELTING POINT -33°C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.232	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless, fuming liquid or crystals.	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		
Do not use hand-held water-base extinguishers.		
SPECIAL FIRE FIGHTING PROCEDURES		
Full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		
--		

PRODUCT DESIGNATION
Stannic Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 4 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation of dust, ingestion.

SKIN AND EYE
IRRITATION moderately severe skin & eyes.

RELEVANT SYMPTOMS OF EXPOSURE

Respiratory and mucous membrane irritant, may cause skin burns.

EFFECTS OF CHRONIC EXPOSURE

--

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Turpentine

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

W/appropriate filter

OTHER PROTECTIVE EQUIPMENT

Rubber apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in dry, well-ventilated area - Protect against water and
direct sunlight.

OTHER PRECAUTIONS

Do not store with combustible materials.

SIGNATURE

DATE

PRODUCT DESIGNATION Stannous Chloride 03-133-6008
--

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 Tin dichloride	FORMULA SnCl ₂ · 2H 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.
				41	mouse	
Note: Intraperitoneal -	mouse 66 mg/kg.		See Note			

SECTION III PHYSICAL DATA	
BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
Decomposes MELTING POINT 37.7°C. ° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.71 at 15.5°C.	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 None available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		

EXTINGUISHING MEDIA None available

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Stannous Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 3.2 mg/CM.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust or ingestion.

SKIN AND EYE

IRRITATION Mild

RELEVANT SYMPTOMS OF EXPOSURE Pain of mouth and throat, vomiting, diarrhea, tenesmus, retching, anuria, liver damage.

EFFECTS OF CHRONIC EXPOSURE

Possible erythematous, papular and granulomatous reactions.

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Calcium Carbide, Ethylene Oxide, Hydrazine Hydrate, 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

Safety glasses or goggles

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 03-357-2708 Strychnine Sulfate

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 Strychnine Sulfate	FORMULA (C ₂₁ H ₂₂ N ₂ O ₂) ₂ H ₂ SO ₄ · 5H ₂ 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.
			5		rat	
				1.7	rat	
			5		bird	

SECTION III PHYSICAL DATA		MW - 856.96
BOILING POINT ° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 200°C.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 3	VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Colorless, odorless, bitter crystal.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT not 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
Strychnine Sulfate

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
0.15 mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION slight

REVELANT SYMPTOMS OF EXPOSURE Increase in deep reflexes, stiffening of knees, extension spasms in arms and legs, death by respiratory failure.

EFFECTS OF CHRONIC EXPOSURE
--

EMERGENCY AND FIRST AID PROCEDURES If symptoms have begun, avoid trying to make vomit; keep quiet, artificial respiration as needed.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

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 03-357-3908 Succinonitrile

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 Ethylene dicyanide	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Succinonitrile	FORMULA CN(CH ₂) ₂ CN

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.
			450		rat.	

SECTION III PHYSICAL DATA		MW - 80.09
BOILING POINT 267°C.	° F.	VAPOR PRESSURE at 100°C
MELTING POINT 58°C	° F.	VAPOR DENSITY (Air = 1) 2.1
SPECIFIC GRAVITY (H ₂ O = 1) 1.02		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 12.8		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless, odorless, waxy material.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 270°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
Carbon dioxide, dry chemical - water or foam may cause frothing.

SPECIAL FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Succononitrile

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION moderate

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

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

EMERGENCY AND FIRST AID PROCEDURES Inhalation - amyl nitrite inhalation, get medical aid; 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)

With acid may yield HCN

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

03-357-4108
Succinyl 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 Succinyl Chloride		FORMULA $\text{ClOC}(\text{CH}_2)_2\text{COC1}$	

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Intraperitoneal - mouse	LD50 - 62 mg/kg			see note		

SECTION III PHYSICAL DATA MW - 154.99

BOILING POINT 193°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 17°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 decomposes		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Fuming, highly refractive 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 - do not use foam or water.		

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

HCl is produced with water addition.

PRODUCT DESIGNATION

Succinyl Chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Cyanosis, headache, coughing, dizziness, weakness, pulmonary edema; on skin contact - severe pain, burns.

EFFECTS OF CHRONIC EXPOSURE Erosion of teeth, jaw necrosis, bronchial irritation and chronic cough.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Avoid water

HAZARDOUS DECOMPOSITION PRODUCTS

Produces HCl.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

Store in cool, dry well-ventilated place inside storage in flammable liquids storage cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS-007446095

PRODUCT DESIGNATION

03-988-2020
03-988-2130
Sulfur Dioxide

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

Sulfurous Acid Anhydride

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Sulfur Dioxide

FORMULA

SO₂

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 toxic concentration in air -						
Inhalation - human - 3 PPM						

SECTION III PHYSICAL DATA MW - 64.07

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
-10°C.		21°C.	2538
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-76°C.		2.26	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.43 (liquid)			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
22.8			

APPEARANCE AND ODOR

Highly irritating, colorless gas.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Non-combustible

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

METHOD USED

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Sulfur Dioxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5 PPM, 13 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation

SKIN AND EYE

IRRITATION moderate - severe

REVELANT SYMPTOMS OF EXPOSURE

Eye irritation, nose and throat irritation, bronchitis, asphyxia.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, get medical aid, wash from eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in well-ventilated area free of combustibles.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION
Sulfuric Acid
03-001-7212
03-001-7247
03-001-7242

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 Sulfuric Acid	FORMULA H_2SO_4

SECTION II HAZARDOUS INGREDIENTS						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			2140		Rat	
			See Note			
#1 lowest published toxic concentration in air - inhalation - human 0.8 mg/kg.						

SECTION III PHYSICAL DATA	
BOILING POINT 338°C.	VAPOR PRESSURE mm Hg.
MELTING POINT 3°C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.841	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid, oily and dense.	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing - keep water away from the acid.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
Sulfuric Acid

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV 1 mg/m³ CARCINOGENIC no

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

REVELANT SYMPTOMS OF EXPOSURE Choking, coughing, headache, dizziness, cyanosis. 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: give milk or milk of magnesia. Inhalation: artificial respiration if necessary - wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID) Water, chlorates, perchlorates, permangantes, picrates, carbides, powdered metals, phosphorous.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

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

MECHANICAL (GENERAL) GLOVES

SPECIAL Neoprene rubber

RESPIRATOR
With appropriate filter

OTHER PROTECTIVE EQUIPMENT
Rubber apron, full face shield.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Keep away from water. Separate from carbides, chlorates, fulminates, nitrates, picrates, powdered metals, and combustible materials.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-141-5902 Tellurium 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 Tellurium				FORMULA Te		
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						
subcutaneous - dog 290 mg/kg.						
SECTION III PHYSICAL DATA A wt. - 127.61						
BOILING POINT 987°C.		° F.	VAPOR PRESSURE mm Hg.			
MELTING POINT 450°C.		° F.	VAPOR DENSITY (Air = 1)			
SPECIFIC GRAVITY (H ₂ O = 1) 6.24			EVAPORATION RATE (_____ = 1)			
SOLUBILITY IN WATER Pts/100 pts H ₂ O Insoluble			VOLATILE % Vol.		% Wt.	
APPEARANCE AND ODOR Grey-white powder						
SECTION IV FIRE AND EXPLOSION HAZARD DATA						
FLASH POINT Not available			FLAMMABLE (EXPLOSIVE) LIMITS		UPPER	
METHOD USED					LOWER	
EXTINGUISHING MEDIA Use water spray						
SPECIAL FIRE FIGHTING PROCEDURES Straight water streams will scatter molten Te.						
UNUSUAL FIRE AND EXPLOSION HAZARDS Burning produces toxic TeO ₂ gas.						

PRODUCT DESIGNATION
Tellurium Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.1 mg/CM. CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION Inhalation, ingestion SKIN AND EYE IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE Sleepiness, loss of appetite, nausea, metallic taste and garlic odor to breath.

EFFECTS OF CHRONIC EXPOSURE

Fatigue, loss of appetite, bronchitis, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES If inhaled - 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

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

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

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Goggles
MECHANICAL (GENERAL)	GLOVES Rubber
SPECIAL	RESPIRATION With proper filter
OTHER PROTECTIVE EQUIPMENT	

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-222-4761
Tert-Butyl 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

Tert-butylbenzene

FORMULA

 $C_6H_5C(CH_3)_3$

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-134.2

BOILING POINT 169°C	° F.	VAPOR PRESSURE at 13°C	mm Hg.
MELTING POINT -58°C	° F.	VAPOR DENSITY (Air = 1)	4.62
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.867			
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 160°F	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 5.8
METHOD USED C.C.		LOWER 0.8
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

Tert-butylbenzene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation (mainly) ingestion

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE

Depression of central nervous system, eye & respiratory system irritation.

EFFECTS OF CHRONIC EXPOSURE

Possible liver & kidney damage.

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) 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

03-223-2372
Tert-Butyl Iodide

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
2 iodo-2 methylpropane

FORMULA
 $(\text{CH}_3)_3\text{CI}$

SECTION II HAZARDOUS INGREDIENTS MW - 184.03

[illegible]

SECTION III PHYSICAL DATA

BOILING POINT 99°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -34°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 Insoluble		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
Not available		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

Tert-butyl iodide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

Not available

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION slight

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

EFFECTS OF CHRONIC EXPOSURE

Dermatitis

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

<p align="center">PRODUCT DESIGNATION</p> <p>Tetra bromoethane (acetylene tetrabromide)</p> <p>03-365-0839</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 1,1,2,2 Tetrabromo Ethane	FORMULA $\text{CHBr}_2\text{CHBr}_2$

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		rabbit	
			400		guinea pig	

SECTION III PHYSICAL DATA	
BOILING POINT decomposition 239° to 242°C	° F. MW 345.7
MELTING POINT	° F. VAPOR PRESSURE mm Hg.
SPECIFIC GRAVITY (H ₂ O = 1) 2.9638 (20°/4° C)	VAPOR DENSITY (Air = 1) 11.92
SOLUBILITY IN WATER Pts/100 pts H ₂ O	EVAPORATION RATE (_____ = 1)
APPEARANCE AND ODOR Colorless to yellow liquid with chloroform-like odor.	VOLATILE % Vol. % Wt.

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

EXTINGUISHING MEDIA
Use water for cooling containers.

SPECIAL FIRE FIGHTING PROCEDURES
Full protective clothing

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Tetrabromoethane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 1 ppm, 14 mg/.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of vapor

SKIN AND EYE

IRRITATION yes

RELEVANT SYMPTOMS OF EXPOSURE

Narcotic properties; is a c.n.s. and respiratory depressant;
drowsiness, etc. Possibility of liver and kidney damage.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Remove from exposure, give artificial respiration (if necessary)
rest and keep warm. Do not give stimulants.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

Toxic fumes of carbonyl bromide.

SECTION 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

W/Appropriate filter

OTHER PROTECTIVE EQUIPMENT

(face shield), rubber apron.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Be sure there is adequate ventilation.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-365-1809 Tetrabromophthalic Anhydride

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 Tetrabromophthalic Anhydride	FORMULA C ₆ Br ₄ COOCO

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 - 463.74
BOILING POINT --	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 280°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 slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR crystalline		

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

PRODUCT DESIGNATION
Tetrabromophthalic Anhydride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation (mainly)

SKIN AND EYE
IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE Coughing, sneezing, respiratory system irritation, dermatitis, eye irritation.

EFFECTS OF CHRONIC EXPOSURE Bronchitis, eye irritation, inflammation of respiratory tract; bloody nasal discharge.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, oxygen to relieve respiratory distress; wash skin & eyes; get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

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

03-365-2309
Tetra-N-Butylammonium 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

Tetra-N-Butylammonium Iodide

FORMULA

(C₄H₉)₄NI

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 - 369.38

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
148°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			
crystal leaves			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Tetra-N-Butylammonium Iodide

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 Irritates eyes & skin, nausea, vomiting, dizziness, central nervous system depression.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis

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

Safety goggles

MECHANICAL (GFCNFRAT)

GLOVES

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

1,1,2,2-Tetrachloroethane
03-365-2809

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

1,1,2,2-Tetrachloroethane

FORMULA

 $\text{CHCl}_2\text{CHCl}_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			See notes 1 and 2			
#1 lowest published toxic dose oral - human 30 mg/kg.						
#2 lowest published lethal concentration in air - inhalation - rat 1000 PPM						

SECTION III PHYSICAL DATA MW - 167.86

BOILING POINT 146.3°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -43.8°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.6 at 20°/4°C.		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Heavy, colorless, mobile liquid, chloroform-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

Probably noncombustible

METHOD USED

FLAMMABLE
(EXPLOSIVE)
LIMITS

UPPER

LOWER

EXTINGUISHING MEDIA

SPECIAL FIRE FIGHTING PROCEDURES

Use water for cooling containers exposed by fire. Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Upon heating may decompose to produce flammable and toxic materials.

PRODUCT DESIGNATION

1,1,2,2 Tetrachloroethane

SECTION V HEALTH HAZARD DATA Most poisonous of chlorinated HC

TOXIC LEVEL

TLV - 5 PPM, 35 mg/CM

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation of vapor percutaneous absorption of liquid IRRITATION severe

RELEVANT SYMPTOMS OF EXPOSURE

Irritation of eyes and nose, followed by headache and nausea. Cyanosis and C.N.S.

EFFECTS OF CHRONIC EXPOSURE

Depression may appear.

Headache, tremor, dizziness, peripheral paresthesia, hypesthesia, or anesthesia.

EMERGENCY AND FIRST AID PROCEDURES

Can produce severe damage to liver and kidneys.

Give artificial respiration until consciousness returns. Remove clothing if contaminated. Rest and keep warm. Obtain medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Nitrogen tetroxide, potassium, potassium hydroxide, 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

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

MECHANICAL (GENERAL)

GLOVES

solvent proof synthetic

SPECIAL

RESPIRATOR

Apron (solvent proof synthetic)

OTHER PROTECTIVE EQUIPMENT

> 20000 ppm self-contained breathing apparatus.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-365-3310
03-365-3309
Tetrachloroethylene
(Perchloroethylene)

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 Ethylene Tetrachloride	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Tetrachloroethylene Perchloroethylene	FORMULA $\text{Cl}_2\text{C}=\text{CCl}_2$

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.
			200		rat	
			see note 1			
#1 Lowest published toxic concentration in air						
inhalation - human 230 PPM						

SECTION III PHYSICAL DATA

MW - 165.85

BOILING POINT 121.2 °F.	VAPOR PRESSURE 22 °C	15.8 mm Hg.
MELTING POINT -22.4 °C	VAPOR DENSITY (Air = 1) 5.83	
SPECIFIC GRAVITY (H ₂ O = 1) 1.631	EVAPORATION RATE (____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 1	VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR colorless liquid, chloroform-like odor.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT nonflammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
water spray, CO₂ or dry chemical -

SPECIAL FIRE FIGHTING PROCEDURES
Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS
When heated to decomposition point (above 140 °C) emits highly toxic fumes of chlorides.

PRODUCT DESIGNATION

Tetrachloroethylene (Perchloroethylene)

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 100 PPM, 670 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

inhalation, ingestion, skin

SKIN AND EYE

IRRITATION moderate

REVELANT SYMPTOMS OF EXPOSURE

Dizziness, nausea, vomiting, loss of weight, muscular weakness,
acute gastrointestinal distress.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage, weight loss, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest, remove from exposure; if swallowed -
wash mouth, 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

Upon decomposition, gives off toxic chloride fumes.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

In hood

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

03-365-5809
Tetramethylammonium 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 Tetramethylammonium Bromide	FORMULA (CH ₃) ₄ 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

MW - 154.06

BOILING POINT subl. > 360°C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT d > 230°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.56		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 55		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 Carbon dioxide, dry chemical.		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

Tetramethylammonium 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

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 skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Goggles

MECHANICAL (GENERAL)

GLOVES

SPECIAL

RESPIRATOR

Self-contained breathing apparatus.

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS - 000075570

PRODUCT DESIGNATION

03-365-5909

Tetramethylammonium 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 Tetramethylammonium Chloride	FORMULA (CH ₃) ₄ N 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.
				40	mouse	
Lowest published lethal dose -				See Note		
Subcutaneous - rabbit - 6 mg/kg.						

SECTION III PHYSICAL DATA

BOILING POINT > 300°C. sublimes	° F.	VAPOR PRESSURE	MW - 109.62	mm Hg.
MELTING POINT 425°C.	° F.	VAPOR DENSITY (Air = 1)		
SPECIFIC GRAVITY (H ₂ O = 1) 1.17		EVAPORATION RATE (_____ = 1)		
SOLUBILITY IN WATER Pts/100 pts H ₂ O 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 Carbon dioxide, dry chemical.		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

Tetramethylammonium Chloride

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 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 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

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-365-6109 Tetramethylammonium 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 Tetramethylaminonium Iodide	FORMULA (CH ₃) ₄ NI

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 -						
1. Intraperitoneal - mouse - 40 mg/kg						
2. Subcutaneous - mouse 33 mg/kg						
3. Intravenous - mouse 3 mg/kg						

SECTION III PHYSICAL DATA		MW - 201.06
BOILING POINT ° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT ° F.	VAPOR DENSITY (Air = 1)	
Decomposes 230°C	EVAPORATION RATE (_____ = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.84	VOLATILE	% Vol. % Wt.
SOLUBILITY IN WATER Pts/100 pts H ₂ O slightly soluble		
APPEARANCE AND ODOR pale yellow crystals		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT none available	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA water, carbon dioxide, dry chemical		
SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION

Tetramethylammonium Iodide

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

Nausea, vomiting, diarrhea, slurred speech, visual disturbances, drowsiness, coma.

EFFECTS OF CHRONIC EXPOSURE

Neurotoxic effects.

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

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

CAS-000075592

PRODUCT DESIGNATION

03-365-6009
Tetramethylammonium HydroxideMATERIAL SAFETY
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

Tetramethylammonium Hydroxide

FORMULA

 $(\text{CH}_3)_4\text{NOH}$

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						
subcutaneous - mouse 20 mg/kg						

SECTION III PHYSICAL DATA MW - 91.15

BOILING POINT decomposes	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 25°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) ~ 1.0		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 151		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR a liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Wear full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Tetramethylammonium Hydroxide

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 Severe irritation of eyes and respiratory system; if swallowed -
alkali attack on digestive system.

EFFECTS OF CHRONIC EXPOSURE

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE
	Goggles
MECHANICAL (GENERAL)	GLOVES
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>03-365-7309 Tetramethylene Chloride</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 1,4 Dichlorobutane				FORMULA $\text{ClC}_4\text{H}_8\text{Cl}$		
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 - 127.02						
BOILING POINT 155°C		° F.	VAPOR PRESSURE at 20°C 4 mm Hg.			
MELTING POINT -39°C		° F.	VAPOR DENSITY (Air = 1) 4.4			
SPECIFIC GRAVITY (H ₂ O = 1) 1.14			EVAPORATION RATE (_____ = 1)			
SOLUBILITY IN WATER Pts/100 pts H ₂ O			VOLATILE		% Vol.	% Wt.
APPEARANCE AND ODOR Colorless, mobile liquid with mild, pleasant odor.						
SECTION IV FIRE AND EXPLOSION HAZARD DATA						
FLASH POINT 126°F			FLAMMABLE (EXPLOSIVE) LIMITS		UPPER	
METHOD USED closed cup					LOWER	
EXTINGUISHING MEDIA carbon dioxide, dry chemical						
SPECIAL FIRE FIGHTING PROCEDURES Water may be ineffective.						
UNUSUAL FIRE AND EXPLOSION HAZARDS						

PRODUCT DESIGNATION
Tetramethylene Chloride

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.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, 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

INCOMPATABILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

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

WASTE DISPOSAL METHOD

SECTION VIII SPECIAL PROTECTION INFORMATION

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

03-365-4809
03-365-4819
Tetrahydrofuran

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 Epoxy butane

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Cyclotetramethylene Oxide

FORMULA

 C_4H_6O

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 3000 mg/kg						
Intraperitoneal - rat 500 mg/kg						

SECTION III PHYSICAL DATA

MW - 72.10

BOILING POINT 65°C.	° F.	VAPOR PRESSURE at 15°C.	mm Hg.
			114
MELTING POINT -109°C	° F.	VAPOR DENSITY (Air = 1)	
		2.5	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.89			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
soluble			
APPEARANCE AND ODOR			
Colorless liquid, ether-like odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 6°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 11.8%
METHOD USED		LOWER 2%

EXTINGUISHING MEDIA

Alcohol foam, carbon dioxide, dry chemical. Water may be ineffective.

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles & self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Tetrahydrofuran

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

200 PPM, 590 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Ingestion, inhalation

SKIN AND EYE

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE

Eye and mucous membrane irritation, headache.

EFFECTS OF CHRONIC EXPOSURE

Liver and kidney damage.- by ingestion.

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

May form explosive mixture with sodium aluminum hydride.

HAZARDOUS DECOMPOSITION PRODUCTS

May form peroxide when exposed to light or air.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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, dark well-ventilated area. If inside, store in standard flammable liquids cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-365-3809
Tetrachlorohydroquinone

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>Tetrachlorohydroquinone</u>	FORMULA <u>C₆Cl₄(OH)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 - mouse	25 mg/kg.					

SECTION III PHYSICAL DATA MW - 245.9

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 240°C ° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O <u>insoluble</u>	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR <u>yellow crystals</u>	

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT <u>none available</u>	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA
Water, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Tetrachlorohydroquinone

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

Tremors, convulsions, shortness of breath, respiratory

system irritation.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - drink water, epsom salts solution, 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 gloves

SPECIAL

RESPIRATION

Self-contained

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-365-4309
Tetrachlorophthalic Anhydride

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 Tetrachlorophthalic Anhydride	FORMULA C_6Cl_4COOCO

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 - 285.92

BOILING POINT 371°C	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 256°C	° F.	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 needle-like crystals.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

PRODUCT DESIGNATION
Tetrachlorophthalic Anhydride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Ingestion, inhalation (mainly)

SKIN AND EYE
IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE
Coughing, sneezing, respiratory irritation, dermatitis,
eye irritation.

EFFECTS OF CHRONIC EXPOSURE
Bronchitis, eye irritations, inflammation of respiratory tract;
bloody nasal discharge.

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, oxygen to relieve respiratory distress;
wash skin & eyes; get medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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 (GENFRAI)	GLOVES
SPECIAL	RESPIRATOR
OTHER PROTECTIVE EQUIPMENT	With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-365-8509
Thioacetamide

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 Thioacetamide		FORMULA CH_3CSNH_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 - oral - rat 200 mg/kg.			See Note			

SECTION III PHYSICAL DATA MW - 75.13

BOILING POINT ° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 115°C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 16.3	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless leaflets, slight odor of mercaptans.	

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

Thioacetamide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

Yes

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Slight

REVELANT SYMPTOMS OF EXPOSURE

Drowsiness, fatigue, nausea, acidosis, skin eruptions.

EFFECTS OF CHRONIC EXPOSURE

Liver damage

EMERGENCY AND FIRST AID PROCEDURES

inhalation - rest.

If swallowed - induce vomiting, 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

Rubber

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION

03-203-8310
Thioglycolic 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 Mercaptoacetic Acid	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Thioglycolic Acid	FORMULA HSCH ₂ COOH

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 92.11

BOILING POINT 123°C at 29 mm.	° F.	VAPOR PRESSURE 106°C	mm Hg.
MELTING POINT -16.5°C	° F.	VAPOR DENSITY (Air = 1)	11
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, disagreeable odor			

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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Thioglycolic Acid

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

Weakness, gasping, respiration, convulsions, severe eye and skin irritant.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

If swallowed - drink water, milk of magnesia, 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

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

03-366-0401
Thiosemicarbazide

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 Thiosemicarbazide	FORMULA $\text{NH}_2\text{CSNHNH}_2$

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.
			9		bird	
Notes:			See Notes			
1. Lowest published lethal dose						
oral - rat 15 mg/kg						
2. Intraperitoneal - mouse LD ₅₀ 1mg/kg						
intraperitoneal - guinea pig - LD ₅₀ 24 mg/kg						

SECTION III PHYSICAL DATA MW - 91.13

BOILING POINT sublimes	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 183°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O S		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR			

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
Thiosemicarbazide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC NO

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion, skin

SKIN AND EYE
IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE
Irritation of skin, eyes and mucous membranes, gastroenteric disturbances, anemia.

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

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash 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

03-365-9309
Thionyl 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

Sulfurous Oxychloride

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Thionyl Chloride

FORMULA

SOCl₂

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 - 118.97

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
79°C		at 21.4°C	100
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
-105°C		4.1	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.64			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
decomposes			
APPEARANCE AND ODOR			
Colorless to yellow to red liquid.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Thionyl 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 skin, eyes, mucous membranes and

respiratory tract.

EFFECTS OF CHRONIC EXPOSURE

--

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Water

HAZARDOUS DECOMPOSITION PRODUCTS

Reacts with water to produce HCl and SO₂.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN 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

<p align="center">PRODUCT DESIGNATION</p> <p>03-365-9709 Thiophenol</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 Phenyl Mercaptain	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Thiophenol	FORMULA C ₆ H ₅ SH

SECTION II HAZARDOUS INGREDIENTS 6 5						
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀ PPM	
			ORAL	PERCUT.	SPECIES	CONC.
			24		Bird	
			46		Rat	
					Mouse	28
					Rat	33
				300	Rat	
				134	Rabbit	

SECTION III PHYSICAL DATA MW - 110.2	
BOILING POINT 168°C	° F. VAPOR PRESSURE mm Hg.
MELTING POINT -15°C	° F. VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.07	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very slightly soluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR liquids, penetrating 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

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Thiophenol

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC
no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION
coverc

REVELANT SYMPTOMS OF EXPOSURE
Skin and mucous membrane irritation, headache, dizziness, dermatitis.

EFFECTS OF CHRONIC EXPOSURE
--

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - artificial respiration as necessary; if swallowed - induce vomiting, get medical aid, gastric lavage; 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
-----------	------

<p align="center">PRODUCT DESIGNATION</p> <p>Thiourea 03-366-0901</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 Thiocarbamide	FORMULA $\text{NH}_2\text{-CS-NH}_2$

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.
			20		rat	

SECTION III PHYSICAL DATA		MW - 76.12	
BOILING POINT <u>d</u>	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT <u>180-2°C.</u>	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) <u>1.41</u>		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O <u>9.2</u>		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR <u>Rhombic crystals.</u>			

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT <u>None available</u>	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER

EXTINGUISHING MEDIA <u>Carbon dioxide, dry chemical.</u>
SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS <u>Burns to form SO₂ fumes.</u>
--

PRODUCT DESIGNATION
Thiourea

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL	None available	CARCINOGENIC	neoplastic effects
PRINCIPLE ROUTES OF ABSORPTION	Ingestion, inhalation of dust	SKIN AND EYE	
RELEVANT SYMPTOMS OF EXPOSURE	Dermatitis	IRRITATION	slight
EFFECTS OF CHRONIC EXPOSURE	Ingestion - depression of bone marrow, anemia, leukopenia, allergic skin eruptions.		
EMERGENCY AND FIRST AID PROCEDURES	Inhalation - rest; if swallowed - induce vomiting, get medical aid; wash from skin & eyes.		

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of sulfur and 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

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-150-4003 Titanium 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 Titanium Tetrachloride	FORMULA $TiCl_4$

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		
Lowest published lethal concentration in air					
inhalation - mouse 10 mg/C.M. - 2 hours.					

SECTION III PHYSICAL DATA		MW - 189.73
BOILING POINT 136°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -30°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 1.726		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O S		VOLATILE % Vol. % Wt.

APPEARANCE AND ODOR
Colorless to light yellow liquid - fumes in moist air.

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

SPECIAL FIRE FIGHTING PROCEDURES
Water spray if necessary to keep container cool - full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Reacts with water to produce HCl.

PRODUCT DESIGNATION Titanium Chloride	
SECTION V HEALTH HAZARD DATA	
TOXIC LEVEL Not available TLV (5 PPM HCl)	CARCINOGENIC No
PRINCIPLE ROUTES OF ABSORPTION Inhalation, ingestion	SKIN AND EYE IRRITATION Yes
RELEVANT SYMPTOMS OF EXPOSURE Vapor irritating to skin and respiratory system, severe irritation to digestive tract.	
EFFECTS OF CHRONIC EXPOSURE Repeated exposure can cause symptoms similar to silicosis.	
EMERGENCY AND FIRST AID PROCEDURES Wash from skin immediately; inhalation - artificial respiration and shock treatment if needed; if swallowed drink water or milk immediately, give milk of magnesia, get medical aid.	
SECTION VI REACTIVITY DATA	
CONDITIONS CONTRIBUTING TO INSTABILITY Reacts with moisture of the air to produce HCl fumes.	
CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION	
INCOMPATIBILITY (MATERIALS TO AVOID) Water	
HAZARDOUS DECOMPOSITION PRODUCTS	
SECTION VII SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Cover spills with sodium bicarbonate. Remove to container for disposal.	
WASTE DISPOSAL METHOD	
SECTION VIII SPECIAL PROTECTION INFORMATION	
VENTILATION REQUIREMENTS LOCAL EXHAUST Handle in hood	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Face shield
MECHANICAL (GENERAL)	GLOVES Rubber gloves
SPECIAL	RESPIRATOR With proper filter
OTHER PROTECTIVE EQUIPMENT Wear protective clothing.	
SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Keep bottle tightly closed.	
OTHER PRECAUTIONS	
SIGNATURE	DATE

<p align="center">PRODUCT DESIGNATION</p> <p>03-366-1501 O-Toluidine 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 O-Toluidine Dihydrochloride	FORMULA (HClNH ₂ (CH ₃)C ₆ H 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 - 285.22	
BOILING POINT ° 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	VOLATILE % Vol.	% Wt.	
0.9			
APPEARANCE AND ODOR Scales			

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.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

O-Toluidine Dihydrochloride

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 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.

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

Toluene
03-366-2401
03-366-2431

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

Toluol

FORMULA

$C_6H_5CH_3$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀ mg/kg		LC ₅₀ P.P.M.	
			ORAL	PERCUT.	SPECIES	CONC.
			3000		Rat	
			See Note 1			
#1 Lowest published toxic concentration in air						
Inhalation - human - 200 P.P.M.						

SECTION III PHYSICAL DATA

MW - 92.13

BOILING POINT

° F.

110.4°C.

VAPOR PRESSURE

at 30°C.

mm Hg.

36.7

MELTING POINT

° F.

-95°C. to -94.5°C.

VAPOR DENSITY (Air = 1)

3.14

SPECIFIC GRAVITY (H₂O = 1)

EVAPORATION RATE (_____ = 1)

SOLUBILITY IN WATER Pts/100 pts H₂O

VOLATILE

% Vol.

% Wt.

APPEARANCE AND ODOR

Colorless liquid; benzol-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT

40°F.

FLAMMABLE
(EXPLOSIVE)

UPPER

7.1

METHOD USED

C.C.

LIMITS

LOWER

1.2

EXTINGUISHING MEDIA

Use carbon dioxide, dry chemical or foam. Water may be ineffective.

SPECIAL FIRE FIGHTING PROCEDURES

Wear goggles and self-contained breathing apparatus.

INITIAL FIRE AND EXPLOSION HAZARDS

Vapors form explosive mixtures with air.

PRODUCT DESIGNATION
Toluene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV 100 PPM, 375 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of vapor, ingestion

SKIN AND EYE

IRRITATION moderate

RELEVANT SYMPTOMS OF EXPOSURE Dizziness, headache, nausea, vomiting, shallow, rapid respiration; paralysis, unconsciousness, convulsions, deliriums; tightness in chest.

EFFECTS OF CHRONIC EXPOSURE Headache, loss of appetite, drowsiness, nervousness, pallor, anemia, petechiae, and abnormal bleeding.

EMERGENCY AND FIRST AID PROCEDURES Remove from exposure; give artificial respiration with oxygen, do not give epinephrine or ephedrine or related drugs. Obtain medical aid.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

Potentially hazardous reaction with mixture of nitric and sulfuric 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

Neoprene
RESPIRATOR
W/appropriate filter

OTHER PROTECTIVE EQUIPMENT

In high concentrations positive pressure air mask.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Protect against physical damage. Storage should be in a standard flammable liquids storage room or cabinet.

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-366-3401 Toluhydroquinone

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 Methy, 2,5 Hydroquinone	FORMULA $\text{CH}_3\text{C}_6\text{H}_3(\text{OH})_2$

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

SECTION III PHYSICAL DATA	
BOILING POINT --	VAPOR PRESSURE mm Hg.
MELTING POINT 129°C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O soluble	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR leaflets	

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

EXTINGUISHING MEDIA Carbon dioxide, dry chemical, water.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Tolubhydroquinone

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

None available

SKIN AND EYE

Inhalation, ingestion, skin

IRRITATION Severe

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

EFFECTS OF CHRONIC EXPOSURE

Eye damage, dermatitis.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - induce vomiting, gastric lavage, medical aid; wash from skin & eyes.

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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

<p align="center">PRODUCT DESIGNATION</p> <p>03-366-3901 M-Toluidine</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 3-Amino Toluene	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 3-Methyl Aniline	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{NH}_2$

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.
			974		rat	
			See Note			
1. Lowest published lethal dose intraperitoneal - mouse 150 mg/kg						

SECTION III PHYSICAL DATA		MW - 107.2	
BOILING POINT 203.4°C.	° F.	VAPOR PRESSURE at 41°C.	mm Hg.
MELTING POINT -31.3°C.	° F.	VAPOR DENSITY (Air = 1)	1
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.989			
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
N/A 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 When heated emits highly toxic fumes.

PRODUCT DESIGNATION

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 - gash mouth, give emetic, get medical aid; wash from 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

May react vigorously with oxidizing materials.

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 03-366-4001 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 2-Methyl Aniline	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 2 Amino Toluene	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{NH}_2$

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.
			900		Rat	
				3250	Rabbit	

SECTION III PHYSICAL DATA	
BOILING POINT 200.4°C.	VAPOR PRESSURE at 44°C
MELTING POINT -16.4°C.	VAPOR DENSITY (Air = 1) 3.7
SPECIFIC GRAVITY (H ₂ O = 1) 1.004	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 1.5	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 185°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED C.C.		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

O-Toluidine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 5 PPM, 22 mg/C.M.

CARCINOGENIC neoplastic

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION 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 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)

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

Safety goggles

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

OTHER PROTECTIVE EQUIPMENT

With proper filter

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

PRODUCT DESIGNATION 03-366-4101 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 P-Methyl Aniline	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS P-Amino Toluene	FORMULA <chem>CH3C6H4NH2.HCl</chem>

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.
			1285		Rat
			42		Bird

SECTION III PHYSICAL DATA	
BOILING POINT °F. 200.6°C.	VAPOR PRESSURE mm Hg. at 42°C. 1
MELTING POINT °F. 43.8°C.	VAPOR DENSITY (Air = 1) 3.90
SPECIFIC GRAVITY (H ₂ O = 1) 1.046	EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.74	VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR crystals	

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT 188°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD-USED C.C.		LOWER
EXTINGUISHING MEDIA Carbon dioxide, dry chemical, foam and water spray.		

SPECIAL FIRE FIGHTING PROCEDURES Wear full protective clothing.
UNUSUAL FIRE AND EXPLOSION HAZARDS Emits toxic fumes when heated.

PRODUCT DESIGNATION

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 - wash mouth, give emetic, get medical aid; wash from 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)

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

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 03-366-4401 P-Toluidine 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 P-Amino toluene hydrochloride	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS P-Methyl aniline hydrochloride	FORMULA $\text{CH}_3\text{C}_6\text{H}_4\text{NH}_2\cdot\text{HCl}$

SECTION II HAZARDOUS INGREDIENTS					
BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀
			ORAL	PERCUT.	SPECIES
Note: LD50 intraperitoneal - rat 399 mg/kg			See Note:		

SECTION III PHYSICAL DATA		MW - 143.6
BOILING POINT 257.5°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 243°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 22.9		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Grey white crystals.		

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT N/A	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

P-Toluene hydrochloride

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

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, 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)

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

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>03-367-8602 Tribromoethylene</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 Acetylene Bromide	FORMULA CHBr = CBr 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 - 264.78	
BOILING POINT 164°C.	° F. VAPOR PRESSURE mm Hg.
MELTING POINT -	° F. VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.71	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 flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA		

SPECIAL FIRE FIGHTING PROCEDURES
UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Tribromoethylene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
none available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
inhalation, ingestion

SKIN AND EYE
IRRITATION yes

REVELANT SYMPTOMS OF EXPOSURE inhalation - headache, dizziness, nausea, unconsciousness;
ingestion - same as inhalation; eye irritation.

EFFECTS OF CHRONIC EXPOSURE
Anemia, liver damage, respiratory trouble.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, keep warm; ingestion - wash mouth,
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)
Reacts explosively with aluminum powder.

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Mop up

WASTE DISPOSAL METHOD
Burial - call safety department

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE safety glasses
MECHANICAL (GENERAL)	GLOVES rubber 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

03-366-8401
1,2,3 Tribromopropane

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 Glycerol Tribromohydrin	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 1,2,3-Tribromopropane	FORMULA $\text{CH}_2\text{BrCHBrCH}_2\text{Br}$

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 - 280.82

BOILING POINT 221 °F.	VAPOR PRESSURE mm Hg.
MELTING POINT 17°C.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 2.44	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

Foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Tribromopropane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

None available

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation, ingestion, skin

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE

lungs, narcosis.

Eye and throat irritation, edema and hemorrhaging in

EFFECTS OF CHRONIC EXPOSURE

Heart and liver damage.

EMERGENCY AND FIRST AID PROCEDURES

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

CAS - 000079005

PRODUCT DESIGNATION
Cement T-339
1,1,2 Trichloroethane
03-367-0084

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

Vinyl Trichloride

CH2ClCHCl2

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.
			580		Rat	
				3730	Rabbit	
Note:						
Lowest published lethal concentration in air			See Note			
Inhalation - rat 500 PPM/8 hours.						

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	MW - 133.4
114°C.		at 35.2°C.	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	40
-35°C.		4.6	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.4416			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.44			
APPEARANCE AND ODOR			
Liquid, pleasant odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Information not available.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Cement T-339 1,1,2 Trichloroethane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 10 PPM, 45 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Inhalation or skin absorption.

IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE

Irritation of eyes and nose, headache, nausea, cyanosis and

C.N.S. depression.

EFFECTS OF CHRONIC EXPOSURE

Headache, tremor, dizziness, peripheral paresthesia, hypesthesia,
or anesthesia.

EMERGENCY AND FIRST AID PROCEDURES

Artificial respiration, remove contaminated clothing. (Do
not give stimulants), 5% glucose I.V. (to maintain blood pressure)

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

If MAC < 2×10^4 PPM

OTHER PROTECTIVE EQUIPMENT

> 20000 PPM self-contained

Apron

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS - 000079016

PRODUCT DESIGNATION

Trichloroethylene
03-367-0102
03-367-0118
03-367-0143

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 Acetylene Trichloride	FORMULA CHCl ₃ = C Cl 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.
			4920		Rat	
				See Notes		
Lowest published toxic concentration in air						
inhalation - human 160 PPM - 83 months						
inhalation - man 110 PPM - 8 hrs.						
Lowest published lethal concentration in air						
inhalation - human 3000 PPM - 10 months.						

SECTION III PHYSICAL DATA MW - 131.38

BOILING POINT 87°C.	° F.	VAPOR PRESSURE at 25°C.	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	77
SPECIFIC GRAVITY (H ₂ O = 1) 1.4556		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.1		VOLATILE --	% Vol. % Wt.
APPEARANCE AND ODOR Colorless liquid with aromatic odor.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 90°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Alcohol foam, CO ₂		
SPECIAL FIRE FIGHTING PROCEDURES Wear self-contained gas mask.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Reacts explosively with powdered aluminum.		

PRODUCT DESIGNATION

Trichloroethylene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 100 PPM, 535 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Yes

REVELANT SYMPTOMS OF EXPOSURE Inhalation - headache, dizziness, nausea, unconsciousness;
ingestion - same as inhalations; eye irritation.

EFFECTS OF CHRONIC EXPOSURE

Anemia, liver damage, respiratory trouble.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - remove from exposure, rest, keep warm;
ingestion - wash mouth, 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)

Reacts explosively with aluminum powder.

HAZARDOUS DECOMPOSITION PRODUCTS

Decomposes with heat or UV arc to produce phosgene.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Mop up

WASTE DISPOSAL METHOD

Burial - call safety department.

SECTION VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS LOCAL EXHAUST

Call industrial hygiene dept.

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety glasses

MECHANICAL (GENERAL)

"

GLOVES

Rubber 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

CAS - 000096184

PRODUCT DESIGNATION

03-367-1102
1,2,3 TrichloropropaneMATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

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

TRADE NAME AND SYNONYMS Glycerol Trichlorohydrin	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS 1,2,3 Trichloropropane	FORMULA (ClCH ₂) ₂ CHCl

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:			320		rat	
Lowest published lethal concentration in air				1770	rabbit	
inhalation - rat 1000 ppm				See Note		

SECTION III PHYSICAL DATA MW - 147.44

BOILING POINT 157°C.	° F.	VAPOR PRESSURE at 46°C.	10 mm Hg.
MELTING POINT -15°C.	° F.	VAPOR DENSITY (Air = 1) 5.1	
SPECIFIC GRAVITY (H ₂ O = 1) 1.39		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O <0.1		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR colorless liquid			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 180°C.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 12.6% LOWER 3.2%
METHOD USED O.C.		

EXTINGUISHING MEDIA

Water may be used to blanket the fire, foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

1,2,3 - Trichloropropane

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

50 PPM, 300 mg/C.M.

CARCINOGENIC

no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion, skin

SKIN AND EYE

IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE

Eye and throat irritation, edema and hemorrhaging in

lungs, narcosis.

EFFECTS OF CHRONIC EXPOSURE

Heart and liver damage.

EMERGENCY AND FIRST AID PROCEDURES

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

CAS - 000121448

PRODUCT DESIGNATION

03-367-2102
TriethylamineMATERIAL SAFETY
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 Triethylamine	FORMULA (C ₂ H ₅) ₃ 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.
			460		rat	
			546		mouse	
				570	rabbit	
Note:			See Note:			
Lowest published lethal concentration in air -						
inhalation - rate, 1000 PPM/4 hrs.						

SECTION III PHYSICAL DATA MW - 101.19

BOILING POINT 90°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -115°C.	° F.	VAPOR DENSITY (Air = 1) 3.48
SPECIFIC GRAVITY (H ₂ O = 1) 0.73		EVAPORATION RATE (_____ = 1)
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 20°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED O.C.		LOWER

EXTINGUISHING MEDIA

Water may be ineffective - alcohol foam, carbon dioxide,
dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Triethylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

25 PPM, 100 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

SKIN AND EYE

Ingestion, inhalation -

IRRITATION Severe

RELEVANT SYMPTOMS OF EXPOSURE Eye and skin burns, eye irritation and corneal edema,
mucous membrane irritation.

EFFECTS OF CHRONIC EXPOSURE Lung irritation, liver and kidney damage, heart
damage and edema.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - drink water, 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)

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

CAS - 000075503

PRODUCT DESIGNATION

03-367-3102
TrimethylamineMATERIAL SAFETY
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

NN dimethyl, methyl amine

FORMULA

 $(CH_3)_3N$

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	75 mg/kg					
subcutaneous - mouse	1000 mg/kg					
subcutaneous - rabbit	800 mg/kg					

SECTION III PHYSICAL DATA MW - 59.13

BOILING POINT 2.87°C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -124°C	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.662 at -5°C		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O V.S.		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Colorless gas, fish-like odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 38°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 11.6
METHOD USED (25% solution)		LOWER 2
EXTINGUISHING MEDIA Dry chemical or CO ₂ .		

SPECIAL FIRE FIGHTING PROCEDURES Stop flow of gas - wear self-contained mask and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Trimethylamine

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation

SKIN AND EYE
IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE
Irritating to the lungs, upper respiratory tract and eyes.

EFFECTS OF CHRONIC EXPOSURE
--

EMERGENCY AND FIRST AID PROCEDURES
Inhalation - rest, keep warm, 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

MECHANICAL (GENERAL)

Goggles

GLOVES

SPECIAL

Rubber

RESPIRATOR

With proper filter

OTHER PROTECTIVE EQUIPMENT
Face shield, rubber apron.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

OTHER PRECAUTIONS

SIGNATURE

DATE

CAS - 000109648

PRODUCT DESIGNATION

03-367-3502
Trimethylene 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

FORMULA

1,3 - Dibromopropane

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

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Lowest published lethal dose			See Note			
Intraperitoneal - mouse	750 mg/kg					

SECTION III PHYSICAL DATA MW - 201.91

BOILING POINT 167°C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT -36°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.97			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
0.02			
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

Foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Trimethylene 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, narcosis, sleepiness, headache, vomiting.

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, liver and kidney damage.

EMERGENCY AND FIRST AID PROCEDURES

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

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

CAS - 000057556

PRODUCT DESIGNATION

03-367-3902
Trimethylene GlycolMATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

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

TRADE NAME AND SYNONYMS

1,3 dihydroxy propane

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

Trimethylene Glycol

FORMULA

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

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 76.11

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
211°C.		at 125°C.	30
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
		2.6	
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
1.05			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR			
Colorless, odorless liquid.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Trimethylene Glycol

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
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; 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
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

03-367-5602
2,4,6 - Trinitroresorcinol

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

Styphnic acid

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

2,4,6 - Trinitroresorcinol

FORMULA

(NO₂)₃C₆H(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.
			None available			

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
176°C.			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pt's H ₂ O		VOLATILE	% Vol. % Wt.
0.6			
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 Explosive - do not fight fire except for unmanned equipment - use water.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective clothing for rescue operations.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Severe explosion hazard.

PRODUCT DESIGNATION
2,4,6 - Trinitroresorcinol

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

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Keep from oxidizing materials, combustibles and source of heat.

OTHER PRECAUTIONS

SIGNATURE	DATE
-----------	------

CAS: 000102692

PRODUCT DESIGNATION

03-367-8102
Tri-N-PropylamineMATERIAL SAFETY
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

Tri-N-Propylamine

FORMULA

 $(C_3H_7)_3N$

SECTION II HAZARDOUS INGREDIENTS

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

SECTION III PHYSICAL DATA MW - 143.31

BOILING POINT 157°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT -94°C.	° F.	VAPOR DENSITY (Air = 1) 4.9
SPECIFIC GRAVITY (H ₂ O = 1) 0.76		EVAPORATION RATE (____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O very slightly soluble		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR colorless liquid		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 105°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED open cup		LOWER
EXTINGUISHING MEDIA Carbon dioxide, dry chemical		

SPECIAL FIRE FIGHTING PROCEDURES

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
Tri-N-Propylamine

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 skin burns; eye irritation and corneal edema,
mucous membrane irritation.

EFFECTS OF CHRONIC EXPOSURE Lung irritation, liver and kidney damage, heart damage and
edema.

EMERGENCY AND FIRST AID PROCEDURES If swallowed - induce vomiting, 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

03-154-6035
Vanadium Pentoxide

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 Vanadic Anhydride	CHEMICAL FAMILY
CHEMICAL NAME AND SYNONYMS Vanadium Pentoxide	FORMULA V_2O_5

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 inhalation - human 0.1 mg/C.M./8 hours.			See Note 1			

SECTION III PHYSICAL DATA

BOILING POINT d-1750°C.	° F.	VAPOR PRESSURE mm Hg.
MELTING POINT 800°C.	° F.	VAPOR DENSITY (Air = 1)
SPECIFIC GRAVITY (H ₂ O = 1) 3.357		EVAPORATION RATE (_____ = 1)
SOLUBILITY IN WATER Pts/100 pts H ₂ O 0.07 at 25°C.		VOLATILE % Vol. % Wt.
APPEARANCE AND ODOR Yellow to red powder		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT Not flammable	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER LOWER
METHOD USED		
EXTINGUISHING MEDIA Water		
SPECIAL FIRE FIGHTING PROCEDURES N/A		
INITIAL FIRE AND EXPLOSION HAZARDS N/A		

PRODUCT DESIGNATION
Vanadium Pentoxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 0.5 mg/C.M. . CARCINOGENIC No

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

RELEVANT SYMPTOMS OF EXPOSURE Irritation of eyes, nose, throat and lungs; if swallowed - vomiting, diarrhea, nervous system damage, convulsions.

EFFECTS OF CHRONIC EXPOSURE
Bronchial asthma

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, 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

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

CAS - 001330207

PRODUCT DESIGNATION

03-387-1425
XyleneMATERIAL SAFETY
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

Methyl toluene

FORMULA

 $C_6H_4(CH_3)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
			4300		Rat	
			See Note 1			
#1 Lowest published toxic concentration in air - inhalation - human 200 PPM						

SECTION III PHYSICAL DATA MW - 106.18

BOILING POINT 139°C.	° F.	VAPOR PRESSURE @21°C.	6.72 mm Hg.
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 0.864		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.
APPEARANCE AND ODOR Clear, colorless liquid.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 100°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Foam, carbon dioxide, dry chemical - water spray may be used to reduce rate of burning or cooling containers.		
SPECIAL FIRE FIGHTING PROCEDURES Wear self-contained breathing apparatus.		
UNUSUAL FIRE AND EXPLOSION HAZARDS		

PRODUCT DESIGNATION
Xylene (mixture)

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 100 PPM, 435 mg/C.M.

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 and liver damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - give saline cathartics and demulcents, 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

Consult industrial hygiene department

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

safety glasses

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

CAS - 000108383

PRODUCT DESIGNATION

M-Xylene
03-387-1505MATERIAL SAFETY
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-Methyl toluene

FORMULA

 $C_6H_4(CH_3)_2$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Lowest published lethal concentration in air - inhalation - rat 8000 PPM/4 hours.			See Notes			
Lowest published lethal dose - intraperitoneal - rat 2000 mg/kg.						
oral - rat 5000 mg/kg						
subcutaneous - rat 5000 mg/kg						

SECTION III PHYSICAL DATA MW - 106.18

BOILING POINT 139°C.	° F.	VAPOR PRESSURE @ 28.3°C.	10 mm Hg.
MELTING POINT -48°C.	° F.	VAPOR DENSITY (Air = 1)	3.66
SPECIFIC GRAVITY (H ₂ O = 1) 0.864		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Clear, colorless liquid.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 84°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 7.0%
METHOD USED		LOWER 1.1%

EXTINGUISHING MEDIA Foam, carbon dioxide, or dry chemical. Water spray may be used to reduce rate of burning or to cool containers.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
M-Xylene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 100 PPM, 435 mg/C.M. 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 and coma; burning of skin or eyes.

EFFECTS OF CHRONIC EXPOSURE
Dermatitis, blood and liver damage.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, keep warm; if swallowed - give saline cathartics and demulcents, 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 Consult Industrial Hygiene Dept.	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Safety glasses
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
-----------	------

CAS - 000106423

PRODUCT DESIGNATION

03-387-1705
P-XyleneMATERIAL SAFETY
DATA SHEET

SECTION I SOURCE AND NOMENCLATURE

MANUFACTURER'S NAME

EMERGENCY TELEPHONE NO.

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

TRADE NAME AND SYNONYMS

P-Xylene

CHEMICAL FAMILY

CHEMICAL NAME AND SYNONYMS

1,4 Dimethylbenzene

FORMULA

 $C_6H_4(CH_3)_2$

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.
Lowest published lethal dose			See Note			
Intraperitoneal - rat - 2000 mg/kg			5000		rat	
subcutaneous - rat 5000 mg/kg						
Lowest published lethal concentration in air						
inhalation - mouse 3460 PPM						

SECTION III PHYSICAL DATA MW - 106.18

BOILING POINT 138°C.	° F.	VAPOR PRESSURE at 27°C.	10 mm Hg.
MELTING POINT 13.2°C.	° F.	VAPOR DENSITY (Air = 1)	3.66
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
0.8611			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Clear, colorless liquid.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 103°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 7.0
METHOD USED		LOWER 1.1

EXTINGUISHING MEDIA Foam, carbon dioxide and dry chemical. Water spray may be used to reduce rate of burning or to cool containers.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
P-Xylene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
TLV - 100 PPM

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION Severe

REVELANT 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 and liver damage.

EMERGENCY AND FIRST AID PROCEDURES Inhalation - rest, keep warm; if swallowed - give saline
cathartics and demulcents, get medical aid; wash from skin or 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 Consult industrial hygiene department.	PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE Safety glasses
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

CAS - 000095476

PRODUCT DESIGNATION

03-387-1605
O-XyleneMATERIAL SAFETY
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-Xylene	FORMULA C_8H_{10} (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.
Lowest published lethal dose - intraperitoneal - rat	500 mg/kg.		See Note			
oral - rat 5000 mg/kg						
subcutaneous - rat 2500 mg/kg						
Lowest published lethal concentration in air						
inhalation - mouse 6920 PPM						

SECTION III PHYSICAL DATA MW - 106.18

BOILING POINT 144°C.	° F.	VAPOR PRESSURE at 32°C.	10 mm Hg.
MELTING POINT -25.5°C.	° F.	VAPOR DENSITY (Air = 1) 3.66	
SPECIFIC GRAVITY (H ₂ O = 1) 0.88		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE % Vol.	% Wt.

APPEARANCE AND ODOR

Clear, colorless liquid.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 90°F.	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER 6.0
METHOD USED		LOWER 1.0

EXTINGUISHING MEDIA

Foam, carbon dioxide or dry chemical. Water spray may be used to reduce rate of burning or cooling containers.

SPECIAL FIRE FIGHTING PROCEDURES

Wear self-contained breathing apparatus.

INITIAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
O-Xylene

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 100 PPM, 435 mg/C.M.

CARCINOGENIC no

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Severe

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

EFFECTS OF CHRONIC EXPOSURE

Dermatitis, blood and liver damage.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - rest; if swallowed - give saline cathartic
and demulcents, 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

Consult Industrial Hygiene Dept.

PROTECTIVE EQUIPMENT (SPECIFY TYPES) EYE

Safety glasses

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

03-387-2905
O-Xylylene 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
A, A'-Dibromo-O-Xylene

FORMULA
 $\text{CH}_3\text{C}_6\text{H}_4\text{CHBr}_2$

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 - 263.97

BOILING POINT decomposes	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 93°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 1.96		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O 16.6		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR solid			

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
O-Xylylene Bromide

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
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

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

03-387-3405
M-Xylyl 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-Xylyl Bromide

FORMULA

$$\text{CH}_3\text{C}_6\text{H}_4\text{CH}_2\text{Br}$$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Note:			See Note			
Lowest published lethal dose						
inhalation - human 75 PPM/10 minutes						

SECTION III PHYSICAL DATA MW - 185.08

BOILING POINT 215°C.	° F.	VAPOR PRESSURE at 110°C.	mm Hg.
MELTING POINT -	° F.	VAPOR DENSITY (Air = 1)	25
SPECIFIC GRAVITY (H ₂ O = 1) 1.37		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

Foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
M-Xylyl 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
Eye and respiratory system irritation; severe 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
	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

03-387-3505
O-Xylol 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 - Methylbenzyl bromide

FORMULA

$\text{CH}_3\text{C}_6\text{H}_4\text{CH}_2\text{Br}$

SECTION II HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROXIMATE OR MAXIMUM % WT. OR VOL.	ESTABLISHED OSHA STANDARD	LD ₅₀		LC ₅₀	
			ORAL	PERCUT.	SPECIES	CONC.
Lowest published lethal dose -			See Note:			
Inhalation - human 75 PPM/10 minutes.						

SECTION III PHYSICAL DATA MW - 185.07

BOILING POINT °F.	VAPOR PRESSURE	
224°C.	at 103°C.	25 mm Hg.
MELTING POINT °F.	VAPOR DENSITY (Air = 1)	
21°C.		
SPECIFIC GRAVITY (H ₂ O = 1)	EVAPORATION RATE (_____ = 1)	
1.38		
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

Foam, carbon dioxide, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES

Self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION
O-Xylyl bromide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL
None available

CARCINOGENIC

PRINCIPLE ROUTES OF ABSORPTION
Inhalation, ingestion

SKIN AND EYE
IRRITATION Severe

REVELANT SYMPTOMS OF EXPOSURE Eye and respiratory system irritation; severe 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
	Rubber 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 Yttrium Metal 03-159-5006
--

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 Yttrium	FORMULA Y

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		AW - 88.91	
BOILING POINT 3200° C.	° F.	VAPOR PRESSURE	mm Hg.
MELTING POINT 1500° C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 5.51		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O Slow reaction		VOLATILE	% Vol. % Wt.
APPEARANCE AND ODOR Grey to black metal.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA		
FLASH POINT N/A	FLAMMABLE (EXPLOSIVE) LIMITS	UPPER
METHOD USED		LOWER
EXTINGUISHING MEDIA Sand, dry powder.		
SPECIAL FIRE FIGHTING PROCEDURES Smother, with suitable dry powder, no water.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Moderate fire hazard.		

PRODUCT DESIGNATION
Yttrium Metal

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL TLV - 1 Mg/C.M. CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION Inhalation, ingestion SKIN AND EYE IRRITATION Moderate

REVELANT SYMPTOMS OF EXPOSURE Irritation to respiratory system and eyes; kidney damago, internal damage if swallowed.

EFFECTS OF CHRONIC EXPOSURE --

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATABILITY (MATERIALS TO AVOID)
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 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

PRODUCT DESIGNATION

03-159-8006
Yttrium OxideMATERIAL SAFETY
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

Yttrium Oxide

FORMULA

 Y_2O_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 LD ₅₀ intraperitoneal	- rat	500 mg/kg.	See Note 1			

SECTION III PHYSICAL DATA

BOILING POINT	° F.	VAPOR PRESSURE	mm Hg.
4300			
MELTING POINT	° F.	VAPOR DENSITY (Air = 1)	
2410			
SPECIFIC GRAVITY (H ₂ O = 1)		EVAPORATION RATE (_____ = 1)	
4.84			
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.
1.			
APPEARANCE AND ODOR			
Yellow to white powder			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

N/A

PRODUCT DESIGNATION

Yttrium Oxide

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 1 Mg/C.M.

CARCINOGENIC No

PRINCIPLE ROUTES OF ABSORPTION

Inhalation, ingestion

SKIN AND EYE

IRRITATION Moderate

RELEVANT SYMPTOMS OF EXPOSURE Irritation of eyes and respiratory tract; kidney damage;
internal damage if swallowed.

EFFECTS OF CHRONIC EXPOSURE

--

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

SECTION VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

INCOMPATIBILITY (MATERIALS TO AVOID)

HAZARDOUS DECOMPOSITION PRODUCTS

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

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

PRODUCT DESIGNATION

Zinc Chloride
03-161-2007

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

Zinc chloride

FORMULA

ZnCl_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 toxic concentration in air						
inhalation - man	4800 mg/C.M. -	30 months	see notes			
#2 lowest published lethal dose						
intravenous - rat - 75 mg/kg.						
#3 lowest published toxic dose						
parenteral - chicken - 1 mg/kg.						

SECTION III PHYSICAL DATA MW - 136.29

BOILING POINT 732°C.	° F.	VAPOR PRESSURE at 428°C.	mm Hg.
MELTING POINT 262°C.	° F.	VAPOR DENSITY (Air = 1)	
SPECIFIC GRAVITY (H ₂ O = 1) 2.9 at 25°C.		EVAPORATION RATE (_____ = 1)	
SOLUBILITY IN WATER Pts/100 pts H ₂ O		VOLATILE	% Vol. % Wt.

APPEARANCE AND ODOR

Cubic, white, deliquescent crystals.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

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

EXTINGUISHING MEDIA

Water

SPECIAL FIRE FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARDS

PRODUCT DESIGNATION

Zinc chloride

SECTION V HEALTH HAZARD DATA

TOXIC LEVEL

TLV - 1 mg/m³

CARCINOGENIC

neoplastic
effects

PRINCIPLE ROUTES OF ABSORPTION

Inhalation of dust or fume.

SKIN AND EYE

IRRITATION Can be moderately severe.

RELEVANT SYMPTOMS OF EXPOSURE

Gastrointestinal tract & respiratory tract irritation, pulmonary edema.

EFFECTS OF CHRONIC EXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

Treat pulmonary edema, give prednisone or other
corticosteroid 25 to 50 mg. orally daily. - obtain 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

Glasses

MECHANICAL (GENERAL)

GLOVES

Rubber

SPECIAL

RESPIRATOR

Dust mask.

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store in cool, well-ventilated place.

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. Henderscn
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. Kobish
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
31. R. A. Crowell	78. R. K. McConathy
32. W. H. Culbert	79. R. V. McCord
33. R. C. Dahlman	80. W. R. McKnight
34. D. T. Dice	81. J. M. Miller
35. S. E. Dismuke	82. C. A. Mills
36. G. J. Dixon	83. C. A. Mossman
37. R. S. Edwards	84. R. L. Newton
38. W. C. Ellis	85. T. B. Nixson
39. J. C. Elrod	86. L. C. Oakes
40. R. M. Farnham	87. C. L. Ottinger
41. J. A. Fields	88. J. E. Parham
42. J. W. Fields	89. T. W. Pickel
43. G. M. Fowler	90. E. E. Pierce
44. M. L. Frank	91. J. K. Poggenburg
45. C. B. Gaither	92. K. H. Poteet
46. J. L. Gerin	93. D. E. Reichle
47. J. R. Gissell	94. C. R. Rickard

95. H. D. Rose	113. M. K. Wilkinson
96. E. F. Roy	114. J. O. Williams
97. R. W. Schaich	115. J. W. Wilson
98. R. A. Schmidt	116. R. H. Winget
99. O. M. Sealand	117. W. R. Winsbro
100. D. H. Sharp	118-119. Central Research Library
101. J. A. Smith	120. Document Reference Section
102. T. Tamura	121. ORNL Patent Office
103. J. W. Teague	122-123. Laboratory Records Department
104. H. E. Teasley	124. Laboratory Records, ORNL R.C.
105. J. R. Thomas	125-159. Industrial Hygiene Department
106. A. J. Thompson	160. H. H. Abee
107. R. I. Van Hook	161. W. S. Everett
108. J. M. Walden	162. H. F. Higdon
109. H. K. Walker	163. R. G. Jordan
110. A. A. Walls	164. J. F. Morehead
111. W. L. Whaley	165. I. G. Speas
112. G. D. Whitman	166-168. H. Gerstner

EXTERNAL DISTRIBUTION

169. Director, Research and Technical Support Division, ERDA-ORO
 170-196. Technical Information Center