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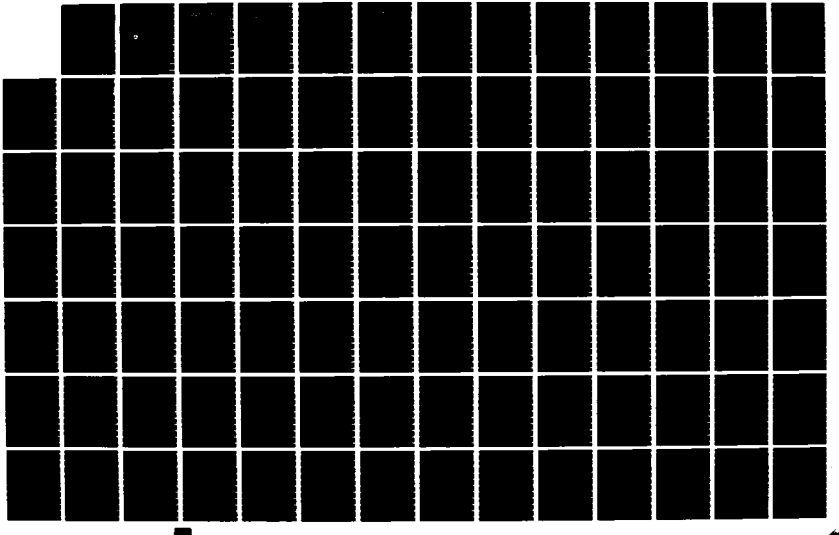

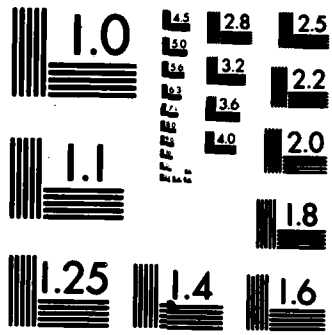

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Report No. **CG-D-10-86**

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

VOL. III OF TASK III FINAL REPORT,
MARINE HAZARDOUS CHEMICAL WORKER

R. JOHN PREVOST
JAMES W. HAMMOND

Prepared for:

U.S. Department of Transportation
United States Coast Guard

Office of Research and Development
Washington, D.C. 20593

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

By
R. John Prevost
James W. Hammond

Volume III of
Task III FINAL REPORT
Contract DTCG23-82-C-20027
SwRI Project 06-7223

Prepared for
U.S. Coast Guard
Commandant (G-FCP-22F/64)
2100 Second Street, S.W.
Washington, D.C. 20590

December 1985

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Post Office Drawer 28510, 6220 Culebra Road
San Antonio, Texas 78284

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Approved:

Ulric S. Lindholm, Vice President
Division of Engineering and Materials Sciences

LEGAL NOTICE

Technical Report Documentation Page

1. Report No.	2. Government Accession No. AD-A170559	3. Recipient's Catalog No.
4. Title and Subtitle Biochemical and Medical Information for Marine Hazardous Substances		5. Report Date December 1985 6. Performing Organization Code
7. Author(s) R. J. Prevost and J. W. Hammond		8. Performing Organization Report No. 06-7223
9. Performing Organization Name and Address Southwest Research Institute P.O. Drawer 28510 6220 Culebra Road San Antonio, Texas 78284		10. Work Unit No. (TRAIS) 11. Contract or Grant No. DTCG23-82-C-20027
12. Sponsoring Agency Name and Address U. S. Coast Guard 2100 Second Street, S.W. Washington, D.C. 20590		13. Type of Report and Period Covered Task III Final Report August 1982 - December 1985 14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This document presents a set of biochemical and medical information for 179 toxic substances found in the marine environment. It is Volume III of a three-volume report which describes a medical monitoring program for marine personnel who may be potentially exposed to hazardous chemicals during their work. The purpose is to provide to medical personnel a reference for certain biochemical and medical information which is not readily available from other sources. For each hazardous substance, a one-page data sheet is provided which covers threshold limit values, classification regarding carcinogenicity, route of entry or exposure, target organs and/or organ related symptoms, acute and chronic effects of exposure, biological fate and metabolite resulting from exposure, recommended protective equipment, and other information.

17. Key Words		18. Distribution Statement
Hazardous Chemicals Toxic Substances Biochemical Data Medical Information	Carcinogenicity Target organs Exposure Effects Routes of Exposure	This document is available to the U.S. public through the National Technical Information Service, Springfield, VA 22161

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	195	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

ACKNOWLEDGEMENTS

The authors of this report wish to acknowledge the significant help received from the occupational physicians on the Task III panel who specified the biochemical and medical topics covered in this report and who guided the formatting of the information on a one-page data sheet for each chemical substance: Dr. S. R. Cowles of Shell Oil Company, Dr. H. G. Hamby of Texaco, Inc., Dr. J. A. Schack of the National Maritime Union, and Professor R. A. Wise of the University of Texas School of Public Health. Acknowledgement is also given to the meticulous work of Ms. Mitzi L. Brownfield and Ms. Darlene Meservy, two students who collected and recorded most of the data presented in this report while working under the supervision of Professor J. W. Hammond at the University of Texas School of Public Health.

TABLE OF CONTENTS

LIST OF TABLES

I. INTRODUCTION

This document presents a set of biochemical and medical information for 179 hazardous substances found in the marine environment. It is Volume III of a three-volume report which describes the design of a medical monitoring program for the marine hazardous chemical worker:

Volume I: A Medical Monitoring Program for the Marine Hazardous Chemical Worker [1]

Volume II: A Marine Hazardous Substances Data System [2]

Volume III: Biochemical and Medical Information for Marine Hazardous Substances

The purpose of this volume is to provide to medical personnel a reference for certain biochemical and medical information which are not readily available from other sources. The material safety data sheets (MSDS) for hazardous substances do not cover the types of data provided herein. Other available sources which do contain some or most of the data provided here are much more detailed and, thus, more cumbersome than the one page of information provided herein.

A listing of the marine hazardous substances for which biochemical and medical information have been prepared is presented in Table 1. Included are certain toxic substances encountered in marine maintenance activities and certain bulk liquid cargos which are known to present a toxic hazard in the workplace. The bulk liquid cargo substances for which data are presented are those substances regulated under Title 46 of the Code of Federal Regulations, Subchapter D or Subchapter O, that the American Conference of Governmental Industrial Hygienists has assigned a threshold limit value for occupational exposures. As such, they are a subset of the more comprehensive listing of marine hazardous substances presented in Volume II [2].

In Table 1, the CHRIS Code designated in the Chemical Hazard Response Information System [3] and the CAS (Chemical Abstract Service) number identified in the Registry of Toxic Effects of Chemical Substances [4] are shown with the chemical name for each substance. Biochemical and medical data

sheets are presented in Appendix A, in alphabetical order, for the substances listed in Table 1. The data format and rationale for the information contained in the data sheets are described in Section II of this report. For asbestos, cresol, ethylamine, isopropylamine, nitrotoluene, and xylene, multiple isomers (or forms in the case of asbestos) are listed separately in Table 1. For each of these groups, a single data sheet is presented in Appendix A which is applicable to the composite group of substances.

TABLE 1. A LISTING OF THE MARINE HAZARDOUS SUBSTANCES FOR WHICH BIOCHEMICAL AND MEDICAL INFORMATION ARE PRESENTED

CHEMICAL NAME	CHRIS CODE	CAS NUMBER
ACETALDEHYDE	AAD	75-07-0
ACETIC ACID	AAC	64-19-7
ACETIC ANHYDRIDE	ACA	108-24-7
ACETONE	ACT	67-64-1
ACETONITRILE	ATN	75-05-8
ACRYLAMIDE (50% OR LESS)	AAM	79-06-1
ACRYLIC ACID	ACR	79-10-7
ACRYLONITRILE	ACN	107-13-1
ALLYL ALCOHOL	ALA	107-18-6
ALLYL CHLORIDE	ALC	107-05-1
AMMONIA, ANHYDROUS	AMA	7664-41-7
N-AMYL ACETATE	AML	628-63-7
ANILINE	ANL	62-53-3
ASBESTOS--AMOSITE		12172-73-5
ASBESTOS--CHRYSOTILE		12001-29-5
ASBESTOS--CROCIDOLITE		12001-28-4
ASPHALT	ASP	8052-42-4
BENZENE	BNZ	71-43-2
BENZYL CHLORIDE	BCL	100-44-7
BUTADIENE (1,3 BUTADIENE)	BDI	106-99-0
BUTANE	BUT	106-97-8
N-BUTYL ACETATE	BCN	123-86-4
SEC-BUTYL ACETATE	BTA	105-46-4
ISO-BUTYL ACRYLATE	BAI	141-32-2
N-BUTYL ALCOHOL	BAN	71-36-3
SEC-BUTYL ALCOHOL	BAS	78-92-2
TERT-BUTYL ALCOHOL	BAT	75-65-0
BUTYLAMINE (ALL ISOMERS)	BTY	109-73-9
BUTYL TOLUENE (P-TERT)		98-51-1
CAMPHOR	CPO	76-22-2
CAPROLACTAM (SOLUTION)	CLS	105-60-2
CARBON BLACK BASE		1333-86-4
CARBON DISULFIDE	CBB	75-15-0
CARBON TETRACHLORIDE	CBT	56-23-5
CAUSTIC SODA SOLUTION	CSS	1310-73-2
CHLORINE	CLX	7782-50-5
CHLOROBENZENE	CRB	108-90-7
CHLOROFORM	CRF	67-66-3
CHLOROPRENE	CRP	126-99-8
CHLOROTOLUENE (O, M, P, AND MIXTURES)	CHI	95-49-8
M-CRESOL	CRL	1319-77-3
O-CRESOL	CSL	1319-77-3
P-CRESOL	CSO	1319-77-3
CRESOLS	CRS	1319-77-3
CROTONALDEHYDE	CTA	123-73-9
CUMENE	CUM	98-82-8
CYCLOHEXANE	CHX	110-82-7
CYCLOHEXANOL	CHN	108-93-0
CYCLOHEXANONE	CCH	108-94-1

TABLE 1. A LISTING OF THE MARINE HAZARDOUS SUBSTANCES FOR WHICH BIOCHEMICAL AND MEDICAL INFORMATION ARE PRESENTED (CONTINUED)

CHEMICAL NAME	CHRIS CODE	CAS NUMBER
CYCLOHEXYLAMINE	CHA	108-91-8
CYCLOPENTADIENE POLYMERS		542-92-7
DIACETONE ALCOHOL	DAA	123-42-2
DIBUTYL PHTHALATE	DPA	84-74-2
O-DICHLOROBENZENE	DBO	95-50-1
P-DICHLOROBENZENE	DBP	106-46-7
DICHLORODIFLUOROMETHANE	DCF	75-71-8
1,1-DICHLOROETHANE	DCH	75-34-3
2,2'-DICHLOROETHYL ETHER	DEE	111-44-4
DICHLOROMETHANE (METHYLENE CHLORIDE)	DCM	75-09-2
DICHLOROMONOFLUOROMETHANE	DFM	75-43-4
1,2-DICHLOROPROPANE	DPP	78-87-5
1,3-DICHLOROPROPENE	DPU	542-75-6
2,2-DICHLOROPROPIONIC ACID	DCN	75-99-0
DICHLOROTETRAFLUOROETHANE	DTE	76-14-2
DICYCLOPENTADIENE	DPT	77-73-6
DIETHANOLAMINE	DEA	111-42-2
DIETHYLAMINE	DEN	109-89-7
DIETHYLENETRIAMINE	DET	111-40-0
DIETHYL PHTHALATE	DPH	84-66-2
DIISOBUTYL KETONE	DIK	108-83-8
DIISOPROPYLAMINE	DIA	108-18-9
DIMETHYLACETAMIDE	DAC	127-19-5
DIMETHYLAMINE	DMA	124-40-3
DIMETHYLFORMAMIDE	DMF	68-12-2
DIMETHYL PHTHALATE	DTL	131-11-3
1,4-DIOXANE	DOX	123-91-1
DIPHENYL	DIL	92-52-4
DIPHENYLMETHANE DIISOCYANATE	DPM	101-68-8
DIPROPYLENE GLYCOL MONOMETHYL ETHER		34590-94-8
EPICHLOROHYDRIN	EPC	106-89-8
ETHANE	ETH	74-84-0
2-ETHOXYETHANOL	EGE	110-80-5
2-ETHOXYETHYL ACETATE		111-15-9
ETHYL ACETATE	ETA	141-78-6
ETHYL ACRYLATE	EAC	140-88-5
ETHYL ALCOHOL	EAL	64-17-5
ETHYLAMINE (40% OR LESS)	EAO	75-04-7
ETHYLAMINE (72% OR LESS)	EAN	75-04-7
ETHYL AMYL KETONE		541-85-5
ETHYLBENZENE	ETB	100-41-4
ETHYL CHLORIDE	ECL	75-00-3
ETHYLENE	ETL	74-85-1
ETHYLENE CHLOROHYDRIN	ECH	107-07-3
ETHYLENEDIAMINE	EDA	107-15-3
ETHYLENE DIBROMIDE	EDB	106-93-4
ETHYLENE DICHLORIDE	EDC	107-06-2
ETHYLENE GLYCOL	EGL	107-21-1
ETHYLENE OXIDE	EOX	75-21-8

TABLE 1. A LISTING OF THE MARINE HAZARDOUS SUBSTANCES FOR WHICH BIOCHEMICAL AND MEDICAL INFORMATION ARE PRESENTED (CONTINUED)

CHEMICAL NAME	CHRIS CODE	CAS NUMBER
ETHYL ETHER	EET	60-29-7
FORMALDEHYDE SOLUTION	FMS	50-00-0
FORMAMIDE	FAM	75-12-7
FORMIC ACID	FMA	64-18-6
FURFURAL	FFA	98-01-1
FURFURYL ALCOHOL	FAL	98-00-0
GASOLINE: AUTOMOTIVE (4.23G PB/GAL)	GAT	8006-61-9
GLUTARALDEHYDE (50% OR LESS)	GTA	111-30-8
GLYCERINE	GCR	56-81-5
HEPTANE	HPT	142-82-5
HEXANE	HXA	110-54-3
HEXYL ACETATE		142-92-7
HEXYLENE GLYCOL	HXG	107-41-5
HYDROGEN CHLORIDE	HDC	7647-01-0
HYDROGEN FLUORIDE	HFX	7664-39-3
ISOAMYL ACETATE	IAT	123-92-2
ISOBUTYL ACETATE	IBA	110-19-0
ISOBUTYL ALCOHOL	IAL	78-83-1
ISOPHORONE	IPH	78-59-1
ISOPHORONE DIISOCYANATE	IPD	4098-71-9
ISOPROPYL ACETATE	IAC	108-21-4
ISOPROPYL ALCOHOL	IPA	67-63-0
ISOPROPYLAMINE	IPP	75-31-0
ISOPROPYLAMINE (90% OR LESS)	IPO	75-31-0
ISOPROPYL ETHER	IPE	108-20-3
MALEIC ANHYDRIDE	MLA	108-31-6
MESITYL OXIDE	MSO	141-79-7
METHACRYLIC ACID	MAD	79-41-4
METHANE	MTH	74-82-8
METHYL ACETATE	MTT	79-20-9
METHYL ACETYLENE, PROPADIENE MIXTURE	MAP	
METHYLACRYLATE	MAM	96-33-3
METHYL ALCOHOL	MAL	67-56-1
METHYLAMINE SOLUTION (42% OR LESS)	MSZ	74-89-5
METHYL BROMIDE	MTB	74-83-9
METHYL CHLORIDE	MTC	74-87-3
METHYL ETHYL KETONE (2-BUTANONE)	MEK	78-93-3
METHYL FORMATE	MFM	107-31-3
METHYL ISOBUTYL CARBINOL	MIC	108-11-2
MEHTYL ISOBUTYL KETONE (HEXONE)	MIK	108-10-1
METHYL METHACRYLATE	MMM	80-62-6
ALPHA-METHYLSTYRENE	MSR	98-83-9
MORPHOLINE	MPL	110-91-8
NAPHTHALENE	NTM	91-20-3
NITRIC ACID	NAC	7697-37-2
NITRIC ACID (70% OR LESS)	NCD	7697-37-2
NITROBENZENE	NTB	98-95-3
1-NITROPROPANE	NPN	108-03-2
2-NITROPROPANE	NPP	79-46-9

TABLE 1. A LISTING OF THE MARINE HAZARDOUS SUBSTANCES FOR WHICH BIOCHEMICAL AND MEDICAL INFORMATION ARE PRESENTED (CONTINUED)

CHEMICAL NAME	CHRIS CODE	CAS NUMBER
O-NITROTOLUENE	NIE	99-08-1
NITROTOLUENE (O, P, AND MIXTURES)	NIT	99-08-1
P-NITROTOLUENE	NTT	99-08-1
NONANE	NAN	111-84-2
OCTANE	OAN	111-65-9
OIL, MISC: MINERAL	OMN	
N-PENTANE	PTA	109-66-0
PERCHLOROETHYLENE(TETRACHLOROETHYLENE)	PER	127-18-4
PHENOL	PHN	108-95-2
PHOSPHORIC ACID	PAC	7664-38-2
PHTHALIC ANHYDRIDE	PAN	85-44-9
PROPANE	PRP	74-98-6
PROPIONIC ACID	PNA	79-09-4
N-PROPYL ACETATE	PAT	109-60-4
N-PROPYL ALCOHOL	PAL	71-23-8
PROPYLENE GLYCOL METHYL ETHER	PME	107-98-2
PROPYLENE OXIDE	POX	75-56-9
PYRIDINE	PRD	110-86-1
SAND		14808-60-7
SILICA		14808-60-7
STYRENE	STY	100-42-5
SULFUR DIOXIDE	SFD	7446-09-5
SULFURIC ACID	SFA	7664-93-9
SULFURIC ACID, SPENT	SAC	7664-93-9
1,1,2,2-TETRACHLOROETHANE	TEC	79-34-5
TETRAHYDROFURAN	THF	109-99-9
TOLUENE	TOL	108-88-3
TOLUENE 2,4-DIISOCYANATE	TDI	584-84-9
O-TOLUIDINE	TLI	95-53-4
1,2,4-TRICHLOROBENZENE	TCB	120-82-1
1,1,2-TRICHLOROETHANE	TCM	79-00-5
TRICHLOROETHYLENE	TCL	79-01-6
1,2,3-TRICHLOROPROPANE	TCN	96-18-4
TRICRESYL PHOSPHATE (<1% O-ISOMER)	TCP	78-30-8
TRICRESYL PHOSPHATE (>1% ORTHO)	TCO	78-30-8
TRIETHYLAMINE	TEN	121-44-8
TRIMETHYL BENZENE		25551-13-7
TRIMETHYL PHOSPHITE	TPP	121-45-9
TURPENTINE	TPT	8006-64-2
N-VALERALDEHYDE	VAL	110-62-3
VINYL ACETATE	VAM	108-05-4
VINYL CHLORIDE	VCM	75-01-4
VINYLIDENECHLORIDE	VCI	75-35-4
VINYLTOLUENE	VNT	25013-15-4
M-XYLENE	XLM	1330-20-7
O-XYLENE	XLO	1330-20-7
P-XYLENE	XLP	1330-20-7

TOTAL OF 194 ITEM(S) IN TABLE

II. DATA FORMAT AND RATIONALE

The format for the biochemical and medical information presented in Appendix A is shown in Table 2. The first line of each data sheet presents the chemical name (AGENT), the CAS number, and the emergency response guide number in the 1984 Emergency Response Guidebook published by the U. S. Department of Transportation [5]. The emergency response guide number provides an immediate reference which describes potential hazards and recommended emergency action procedures for the hazardous substance. Selected synonyms for the hazardous substance are provided on the following line to aid in searching for additional data as may be required.

The third line of information presents occupational exposure limits as defined by the American Conference of Governmental Industrial Hygienists (ACGIH). The time-weighted average (TWA) threshold limit value for airborne exposures in parts per million (ppm) or milligrams per cubic meter (mg/m^3) are presented and an indication is made as to whether or not the substance has been classified by ACGIH as a recognized human carcinogen (A1) or an industrial substance suspected of carcinogenic potential for man (A2). These data were obtained from the 1983-84 publication of threshold limit values [6].

After these first three lines of information, highlights of a number of important biochemical and medical characteristics associated with exposures to the specific hazardous substance are presented. The types of information include:

(1) Route of entry or exposure,
(2) Target organs and/or organ related symptoms,
(3) Acute and chronic effects of exposure,
(4) Biological fate and/or metabolites resulting from exposure,
(5) Medical monitoring and/or specific laboratory tests which should be considered,
(6) Synergism or antagonism associated with exposures,
(7) Carcinogenicity and mutagenicity.

The data presented for these topics were obtained primarily from one of two sources: Occupational Diseases, A Guide to Their Recognition, published by NIOSH [7] and the ACGIH Documentation of the Threshold Limit Values [8].

Finally, a brief description of the types of protective equipment recommended for exposures to the hazardous substance is provided and a listing of the primary references for the information in the data sheet is presented at the bottom of each page.

TABLE 2. FORMAT FOR BIOCHEMICAL AND MEDICAL INFORMATION

AGENT(CAS#): DOT EMERGENCY RESPONSE GUIDE: #

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: mg/m^3: A_1 or A_2:

ROUTE OF ENTRY/EXPOSURE:

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental:

chronic:

BIOL. FATE/METABOLITES:

MEDICAL MONITORING:
(Laboratory)

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:		Yes	No	Comments
	human:			
	animal:			
MUTAGENICITY:	human:			
	mammal:			
	microbe:			

PERSONAL PROTECTIVE EQUIPMENT:

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

REFERENCES

1. Prevost, R. J. and Johnson, D. E., A Medical Monitoring Program for the Marine Hazardous Chemical Worker, Volume I, Task III Final Report, SwRI Project 06-7223, USDOT Contract DTCG23-82-C-20027, July 1985.

2. Prevost, R. J. and Bowles, P. K., A Marine Hazardous Substances Data System, Volume II, Task III Final Report, SwRI Project 06-7223, USDOT Contract DTCG23-82-C-20027, July 1985.

3. Chemical Data Guide for Bulk Shipment by Water, United States Coast Guard Document CIM 16616.6, 1982.

4. Registry of Toxic Effects of Chemical Substances, U. S. Department of Health and Human Services, National Institute for Occupational Safety and Health, 1980.

5. 1984 Emergency Response Guidebook, U. S. Department of Transportation, Document No. DOT P 5800.3, 1984.

6. TLVs, Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment with Intended Changes for 1983-84, The American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, 1984.

7. Occupational Diseases, A Guide to Their Recognition, National Institute for Occupational Safety and Health, 1977.

8. Documentation of the Threshold Limit Values, American Conference of Governmental Industrial Hygienists, Cincinnati, Ohio, 1981 and 1982 editions.

APPENDIX A

Biochemical and Medical Information Sheets

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Acetaldehyde (75-07-0) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: CH_3CHO

ACGIH EXPOSURE LIMITS: TWA ppm:100 mg/m^3: 180 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritation; eyes, URT, LRT, and skin

chronic: Eye, URT and LRT irritation

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing, goggles, and respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Acetic acid (64-19-7) **DOT EMERGENCY RESPONSE GUIDE:** #29

SYNONYMS: H_2C - COOH and vinegar acid

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 25 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Concentrated vapors may cause serious damage to lining membranes of nose, throat, lungs and teeth. Concentrated solutions may cause severe damage to skin and eyes with possible loss of sight.

chronic: Hyperkeratosis of exposed skin, erosion of teeth, chronic inflammation of nose, throat and bronchi with pharyngitis.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Working with glacial acetic acid - wear protective clothing, gloves, goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Acetic anhydride (108-24-7) DOT EMERGENCY RESPONSE GUIDE: #39

SYNONYMS: Acetyl oxide

ACGIH EXPOSURE LIMITS: TWA ppm: C 5 mg/m^3: C 20 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Concentrated vapor exposure--conjunctival and nasopharygeal irritation, cough and dyspnea. Delayed severe burns may occur if not removed immediately from skin and eyes.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review or target organ manifestation.

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing, gloves, goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Acetone (67-64-1) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: Dimethyl ketone

ACGIH EXPOSURE LIMITS: TWA ppm: 750 mg/m^3: 1780 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis
Eye, nose and throat irritation, headache.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Vapor concentrations > 1000 ppm, wear mask.
Protective clothing/goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Acetonitrile (75-05-8) DOT EMERGENCY RESPONSE GUIDE: #28

SYNONYMS: Methyl cyanide, CH_3CN

ACGIH EXPOSURE LIMITS: TWA ppm: 40 mg/m^3: 70 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Enzymes

EFFECTS OF EXPOSURE:

acute; accidental: Chemical asphyxia, flushing of face, chest tightness; irritation of nose and throat, nausea, vomiting, respiratory depression, chest pain.

chronic: None known.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Carbon monoxide and other causes of anoxia; ingestion of members of cabbage family.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respirator, impervious clothing, gloves goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Acrylamide (79-06-1) DOT EMERGENCY RESPONSE GUIDE: #55

SYNONYMS: Acrylic amide

ACGIH EXPOSURE LIMITS: TWA mg/m^3: 0.3 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin absorption

TARGET ORGAN OR SYMPTOM: CNS, PNS

EFFECTS OF EXPOSURE:

acute, accidental: Drowsiness, tingling sensations, fatigue, weakness, a stumbling type of walking, slurred speech, shaking, irritation of skin and eyes.
Severe neuropathy, with latency depending on severity of the poisoning.

chronic: Skin irritation.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: SCBA, approved respirator, chemical goggles and full protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Acrylic Acid (79-10-7) DOT EMERGENCY RESPONSE GUIDE: #28

SYNONYMS: CH_2 - $CHCO_2$

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Moderate/severe skin burns.
Severe eye and skin burns.
May produce scars.
Mild URT effects

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: None in common use.
(Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Goggles, gloves; protective clothing, face shield where splashes likely.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Acrylonitrile (107-13-1) **DOT EMERGENCY RESPONSE GUIDE:** #30

SYNONYMS: Vinyl cyanide, propenenitrile

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 4.5 A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: LRT, Kidneys, CNS, Colon

EFFECTS OF EXPOSURE:

acute, accidental: Confusion, headaches, and weakness, accumulated.

Note: Acrylonitrile can be absorbed from contaminated leather, rubber and clothing.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:	X		
	animal:	X		
MUTAGENICITY:	human:	X		
	mammal:	X		
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Respirator,full protective clothing (not leather or rubber), goggles and hood.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Allyl alcohol (107-18-6) DOT EMERGENCY RESPONSE GUIDE: #28

SYNONYMS: Vinyl carbinol

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin-liquid

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Vapor - highly irritating to eyes, and URT. Liquid - skin irritation and burns, usually delayed and prolonged. Muscle spasm at site of percutaneous absorption. Retrobulbar pain, photophobia.

chronic: Eye necrosis, URT.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None is specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Neoprene protective clothing; approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Allyl Chloride (107-05-1) DOT EMERGENCY RESPONSE GUIDE: #28

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 3 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Eye/nose irritant, liver/kidney pathology.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Liver function tests. Medical exam should include review of target organ manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Goggles, protective clothing and approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ammonia (7664-41-7) DOT EMERGENCY RESPONSE GUIDE: #15

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 25 mg/m^3: 18 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Corrosive, concentrated vapors severe irritant to skin and eyes. Inhalation: headache, perspiration, nausea, vomiting, substernal pain. Prolonged exposure may produce cough, glottal edema, bronchospasm, pulmonary edema and respiratory arrest.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Pulmonary function tests, vision screening. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respiratory, eye and skin protection - eye wash facilities and means of escape.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): n-Amyl Acetate (628-63-7) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 530 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Eye, mucous membrane, skin irritant, headache, drowsiness, CNS depression at high concentrations.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific
Medical exam should include review of target organs' manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator, goggles, protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Aniline (62-53-3) DOT EMERGENCY RESPONSE GUIDE: #57

SYNONYMS: Aniline oil, Aminobenzene

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 10 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Blood

EFFECTS OF EXPOSURE:

acute, accidental: Anoxia, cyanosis by both skin contact and vapors.

chronic: N/A

BIOL. FATE/METABOLITES: Methemoglobin

MEDICAL MONITORING: (Laboratory) MeHbn levels, urine, para-aminophenols. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Skin absorption.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved RT respirator and adequate skin clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Asbestos (1332-21-4) DOT EMERGENCY RESPONSE GUIDE: #31

SYNONYMS: Chrysotile, amosite, crocidolite

ACGIH EXPOSURE LIMITS: TWA ½ fiber/cc > 5 μm in length A_1 or A_2: A_1

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: LRT, GI, Pleura

EFFECTS OF EXPOSURE:

acute, accidental: N/A

chronic: Asbestosis, pleural and lung tissue inflammation.

BIOL. FATE/METABOLITES: Cancers and mesotheliomas of pleural membranes and digestive tract.

MEDICAL MONITORING: (Laboratory) Radiography, cytology, lung functions, asbestos bodies in sputum. Medical exam should include review of target organ manifestations.

SYNERGISM OR ANTAGONISM: Smoking

CARCINOGENICITY:	Yes	No	Comments
human:	X		TLV Documentation 1982; pp 27-30
animal:	X		

MUTAGENICITY:		
human:		X
mammal:		X
microbe:		X

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator, clean work clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Asphalt (Petroleum) fumes (8052-42-4) **DOT EMERGENCY RESPONSE GUIDE:** #27

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA **mg/m^3:** 5 **A_1 or A_2:** No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Skin

EFFECTS OF EXPOSURE:

acute, accidental: Thermal Burns

chronic: Keratosis, dermatitis, acne-like lesions, photosensitization, melanosis.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organs manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	Encyclopedia of Health & Safety, 1971, p. 125
animal:		X	

MUTAGENICITY: human:
mammal:
microbe:

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing; goggles gloves and approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Benzene (71-43-2) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Benzol

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 30 A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS, Peripheral Blood, Bone Marrow

EFFECTS OF EXPOSURE:

acute, accidental: Irritation: skin, eyes and URT. Aspirated - may cause pulmonary edema and hemorrhage.

chronic: Erythrocytes, leukocytes, thrombocytes and platelets; then aplastic anemia, leukopenia and thrombocytopenia, bladder tumors; changes in bone marrow may occur several years after exposure has ceased.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Urine - Total phenol content - quarterly - ≤ standard to > standard - monitor of 2 weeks. Complete blood tests. Medical exam should include review of target manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:	X		
animal:	X		

MUTAGENICITY:		
human:	X	
mammal:	X	
microbe:	X	

PERSONAL PROTECTIVE EQUIPMENT: Approved organic vapor respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Benzyl Chloride (100-44-7) **DOT EMERGENCY RESPONSE GUIDE:** #59

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Kidneys, Blood

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritant to eyes/respiratory tract, delayed pulmonary edema; possible liver and/or kidney damage.

chronic: Dermatitis - local sarcomas from direct contact.

BIOL. FATE, METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manfestation; lung function, kidney and liver damage, blood dyscrasia.

SYNERGISM OR ANTAGONISM: Chlorinated hydrocarbons

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	Sarcoma in rats (1) p. 254; (2) p. 94

MUTAGENICITY:
human:
mammal:
microbe:

PERSONAL PROTECTIVE EQUIPMENT: Approved respiator, goggles and protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1,3-Butadiene (106-99-0) **DOT EMERGENCY RESPONSE GUIDE:** #17

SYNONYMS: Butadiene

ACGIH EXPOSURE LIMITS: TWA ppm: 10 A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS, Thyroid, Testes, Mammary glands

EFFECTS OF EXPOSURE:

acute, accidental: Slightly irritating to eyes and URT.
Narcosis at very high concentrations.

chronic: Potential carcinogenic agent of thyroid, testes and mammary glands.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: None in common use.
(Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:	X		
MUTAGENICITY:	human:		X	
	mammal:	X		
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Butane (106-97-8) DOT EMERGENCY RESPONSE GUIDE: #22

SYNONYMS: C_4H_{10}

ACGIH EXPOSURE LIMITS: TWA ppm: 800 mg/m^3: 1900 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: None

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis effect

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Normally not needed

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): n-Butyl acetate (123-86-4) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: Butyl Ethanoate, acetic acid butyl ester

ACGIH EXPOSURE LIMITS: TWA ppm: 150 mg/m^3: 710 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS,

EFFECTS OF EXPOSURE: Irritant to eyes and URT; headache, drowsiness and unconsciousness.

acute, accidental:

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respiratory protection in acute concentrations.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): sec-Butyl Acetate (105-46-4) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 200 mg/m^3: 950 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes and respiratory tract; CNS depression at high concentrations.

chronic: Dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): n-Butyl acrylate (141-32-2) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 55 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritant to eyes and URT.

chronic: Dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): n-Butyl alcohol (71-36-3) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: n-Butanol

ACGIH EXPOSURE LIMITS: TWA ppm: C 50 mg/m3: C 150 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, CNS, Ears

EFFECTS OF EXPOSURE:

acute, accidental: Lacrimation, blurring of vision, photophobia, dizziness, CNS depression at very high concentrations.

chronic: Hearing loss (auditory nerve), contact dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Audiograms, visual losses. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Synergism with noise has been reported.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator; barrier creams; protective clothing where skin contact may occur; goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): sec-Butyl alcohol **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: 2-Butanol, ethylmethyl carbinol

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 305 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis, eye/skin irritant
CNS depression may occur at very high sustained concentrations.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organs' manifestations.

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Goggles and protective clothing

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): tert-Butyl alcohol (75-65-0) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: 2-methyl-2-propanol

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 300 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: None

EFFECTS OF EXPOSURE:

acute, accidental: Slight skin irritation, narcosis, eye irritant on contact.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific, medical exam should include review of target organs' manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Goggles

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Butylamine (109-73-9) DOT EMERGENCY RESPONSE GUIDE: #68

SYNONYMS: 1-Aminobutane; n-Butylamine

ACGIH EXPOSURE LIMITS: TWA ppm: C 5 mg/m^3: C 15 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes, nose, throat and skin, headaches, flushing of skin of the face, pulmonary edema. Contact: severe eye damage and skin burns.

chronic: Necrosis of skin, eyes and URT.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: None
(Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/goggles; respirator in area of elevated vapor concentrations.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): P-tert-Butyltoluene (98-51-1) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: TBT

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 60 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: LRT, Liver, Kidneys, CNS, CVS

EFFECTS OF EXPOSURE:

acute, accidental: CNS depression, liver and kidney effects, and irritation of URT and LRT.

chronic: CNS and CVS and general weakness.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organs manifestations

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respiratory equipment and goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Camphor, Synthetic (76-22-2) DOT EMERGENCY RESPONSE GUIDE: #32

SYNONYMS: $C_{10}H_{16}$

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 12 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Kidneys, CNS

EFFECTS OF EXPOSURE:

acute, accidental: CNS, as shown by convulsions and severe irritation of CNS.

chronic: Loss of smell and eye irritation.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organs manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respiratory equipment and goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Caprolactam vapor (105-60-2)

SYNONYMS: Aminocaproiclactam

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 20 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritant of nose, eyes and throat.

chronic: Contact dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respiratory protection if needed. Chemical goggles in acute exposures.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Carbon black (1333-86-4)

SYNONYMS: C

ACGIH EXPOSURE LIMITS: TWA mg/m^3: 3.5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: LRT

EFFECTS OF EXPOSURE:

acute, accidental: N/A

chronic: N/A

BIOL. FATE/METABOLITES: (Laboratory) Medical exam should include review of target organ manifestations.

MEDICAL MONITORING: N/A

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing to prevent soiling of skin. Respirator if needed.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Carbon disulfide (75-15-0) DOT EMERGENCY RESPONSE GUIDE: #28

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, CNS, Heart

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis; extreme irritability, uncontrollable anger, suicidal tendencies, toxic manic depressive psychosis. Liquid: blistering with 2nd and 3rd degree burns to skin.

chronic: Nervousness, irritability, indigestion, bizarre dreams, insomnia, excessive fatigue, loss of appetite and headache, defective memory; impotency; polyneuritis, loss of lower extremity reflexes; atherosclerosis and coronary heart disease.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: >10 ppm, respirator with full-face mask and supplied air. Protective clothing goggles, face shields, boots, aprons and coats for splashes/spills.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Carbon tetrachloride (56-23-5) DOT EMERGENCY RESPONSE GUIDE: #55

SYNONYMS: Tetrachloromethane

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 30 A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Liver, Kidneys, CNS, GI

EFFECTS OF EXPOSURE:

acute, accidental: Acute liver/kidney necrosis; CNS depressant - stomach pains, headache, nausea, anorexia and jaundice.

chronic: Liver/kidney damage due to fatty infiltration of organ; dermatitis.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: Liver function test; expired air/blood levels may be useful indicators of exposure. Medical exam should include review of target organs manifestations.

SYNERGISM OR ANTAGONISM: Synergism - substances which cause an increase in the microsomal drug metabolism system (such as ethanol, barbiturates and chlorinated biphenyls and all chlorinated hydrocarbons).

		Yes	No	Comments
CARCINOGENICITY:	human:	X		
	animal:	X		
MUTAGENICITY:	human:		X	
	mammal:	X		
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves, goggles or face shield; approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Caustic soda (1310-73-2) DOT EMERGENCY RESPONSE GUIDE: #60

SYNONYMS: Sodium hydroxide, NaOH, lye

ACGIH EXPOSURE LIMITS: TWA mg/m^3: C 2 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Pneumonitis, severe burns of eyes/skin

chronic: Dermatitis, eye scarring, ulceration of nasal passages, LRT damage.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Impervious protective clothing, gloves, rubber shoes, goggles/face shield, dust respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Chlorine (7782-50-5) **DOT EMERGENCY RESPONSE GUIDE:** #20

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 3 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Burning of eyes, skin, nose, mouth; lacrimation, cough, choking sensation, substernal pain; nausea, vomiting; headache, dizziness; tracheobronchitis, pulmonary edema pneumonia.

chronic: Corrosion of teeth, accelerated aging and LRT changes.

BIOL. FATE/METABOLITES: Strong oxidizing capacity, splits hydrogen from H_2O in moist tissue causing release of nascent O_2 and HCl.

MEDICAL MONITORING: (Laboratory) Lung function tests may be indicated. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator with proper cannister or supplied air. Protective clothing and eye protection.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Chlorobenzene (108-90-7) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Monochlorobenzene

ACGIH EXPOSURE LIMITS: TWA ppm: 75 mg/m^3: 350 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Irritating to eyes, nose and skin. Narcosis.

chronic: May cause liver, kidney and lung damage.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: None in common use.
(Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Barrier creams/protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Chloroform (67-66-3) DOT EMERGENCY RESPONSE GUIDE: #55

SYNONYMS: Tricholormethane

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 50 A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Liver, Kidneys, CNS, Heart

EFFECTS OF EXPOSURE:

acute, accidental: Loss of consciousness, disorientation, cardiovascular depressant, ventricular fibrillation.

chronic: Lassitude, GI disturbances, mental dullness hepatomegaly; dermatitis, kidney damage, embryo toxicity.

BIOL. FATE/METABOLITES:

MEDICAL MONITORING: (Laboratory) Liver/kidney function tests; Medical exam should include review of target organs manifestations.

SYNERGISM OR ANTAGONISM: Synergistic effect with ethyl alcohol.

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:	X		
MUTAGENICITY:	human:		X	
	mammal:	X		
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves >10 ppm, approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): β-Chloroprene (126-99-8) **DOT EMERGENCY RESPONSE GUIDE:** #30

SYNONYMS: 2-chloro-1,3-butadiene

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 45 A_1 or A_2: NO

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Kidneys, CNS, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Primary irritant-skin/eye/mucous membranes
Depression of respiration and asphyxia;
Hyperemia and edema; hair loss.

chronic: Dermatitis, circumscribed necrosis of the cornea;
Depression, CNS; lung liver/kidney, spleen and
myocardial damage.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Liver and lung function tests; kidney function tests
Medical exam should include a review of target organs
manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/goggles; approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): o-Chlorotoluene (95-49-8) **DOT EMERGENCY RESPONSE GUIDE:** #27

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 250 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, SKin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Kidneys, Blood

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritant to eyes/respiratory tract, delayed pulmonary edema; possible liver and/or kidney damage.

chronic: Dermatitis - local sarcomas from direct contact.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation; lung function, kidney and liver damage, blood dyscrasia.

SYNERGISM OR ANTAGONISM: Chlorinated hydrocarbons

CARCINOGENICITY:

	Yes	No	Comments
human:		X	
animal:	X		Sarcoma in rats (1) p. 254 (2) p. 94

MUTAGENICITY:
human:
mammal:
microbe:

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator, goggles and protective clothing.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Cresol (1319-77-3) DOT EMERGENCY RESPONSE GUIDE: #55

SYNONYMS: Cresylic acid, cresylol, hydroxytoluene

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 22 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Liver, Kidneys, GI

EFFECTS OF EXPOSURE:

acute, accidental: Corrosive action on all tissues; systemic poisoning may develop in 20-30 minutes and include muscle weakness, dizziness, dimness of vision, tinnitus, rapid breathing, mental confusion, loss of consciousness; sometimes death.

chronic: Chronic systemic poisoning, including vomiting, difficulty in swallowing, salivation, diarrhea, anorexia, headache, dizziness, mental disturbances, liver/kidney damage.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include target organ test, such as liver/kidney function tests, pulmonary function test, tests for urinary phenolic compounds (biologic limit values), solar dermal damage.

SYNERGISM OR ANTAGNISM: Phenols, coal tar, severe exposure.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing; goggles, gloves and shoes.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Crotonaldehyde (123-73-9) DOT EMERGENCY RESPONSE GUIDE: #28

SYNONYMS: β-methylacrolein

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 6 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritant eyes/mucous membrane; may cause dyspnea, pulmonary edema.

chronic: Sensitization reported in one worker.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of the target organs manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing; goggles respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Cumene (98-82-8) **DOT EMERGENCY RESPONSE GUIDE:** #28

SYNONYMS: Isopropylbenzene

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 245 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, SKin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Kidneys, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes, skin and nose.
Severe exposure may cause CNS depression and pulmonary edema; onset of severe pulmonary edema may be delayed 72 hours.
Narcosis.

chronic: Higher than TLV may cause lung congestion, and kidney and liver damage.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Severe exposure - electrocardiogram, sputum gram stain and culture, and differential white blood cell count. If pulmonary edema occurs, analyze arterial blood gas. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respirator for vapor exposures greater than TLV; face shields or safety goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Cyclohexane (110-82-7) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: C_6H_{12}

ACGIH EXPOSURE LIMITS: TWA ppm: 300 mg/m^3: 1050 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, Liver, Kidneys, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation to eyes and URT, dizziness and nausea. Narcosis and convulsions.

chronic: Slight kidney and liver damage

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Barrier creams/gloves 300-masks.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Cyclohexanol (108-93-0)

SYNONYMS: Hexahydrophenol

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 200 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, SKin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritation to eyes, URT; headache, CNS depression, liver and kidney damage.

chronic: Dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles; approved respirator and protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Cyclohexanone (108-94-1) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: Pimelic ketone, hexanon

ACGIH EXPOSURE LIMITS: TWA ppm: 25 mg/m^3: 100 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys, CNS

EFFECTS OF EXPOSURE:

acute, accidental: CNS depression, bronchitis, narcosis; liquid cyclohexanone may cause corneal injury.

chronic: Liver and kidney damage; dermatitis.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles; approved respirator and protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Cyclohexylamine (108-71-8) DOT EMERGENCY RESPONSE GUIDE: #68

SYNONYMS: $C_6H_{13}N$

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 40 A_1 or A_2: NO

ROUTE OF ENTRY/EXPOSURE: INhalation, SKin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Nausea/vomiting - shock, and damage in brain, liver and kidneys.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	

MUTAGENICITY:	
human:	X
mammal:	X
microbe:	X

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles; approved respirator and protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Cyclopentadiene (542-92-7)

SYNONYMS: 1,3-Chclopentadiene; R-Pentine

ACGIH EXPOSURE LIMITS: TWA ppm: 75 mg/m^3: 200 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritant to nasal passages.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles and approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diacetone alcohol (123-42-2) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: 4-Hydoxyl-4-methyl-2-pentanone; diacetonyl alcohol

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 240 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes and repiratory tract; transient corneal damage; narcosis; chest discomfort.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face mask in areas of acute exposure.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dibutyl Phthalate (84-74-2) **DOT EMERGENCY RESPONSE GUIDE:** #31

SYNONYMS: N-Butyl Phthalate

ACGIH EXPOSURE LIMITS: TWA ppm: -- mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental: Splash; eyes - immediate severe pain; conjunctivitis.

chronic: Teratogenic, based on animal teratogenic data.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Goggles

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): O-Dichlorobenzene (95-50-1) DOT EMERGENCY RESPONSE GUIDE: #58

SYNONYMS: 1,2-Dichlorobenzene; dichlorobenzol

ACGIH EXPOSURE LIMITS: TWA ppm: C 50 mg/m^3: C 300 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritant to eyes and URT; blistering of the skin, symptoms of intoxication; rtythropoesis along with neuropenia from severe skin exposure.

chronic: Sensitization dermatitis - may result in liver, kidney and lung damage.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: Urinary excretion of 2,5-dichlorophenol may be useful as index of exposure. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Chloronated hydrocarbons.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles; protective clothing and approved respirators in areas of vapor concentrations.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): p-Dichlorobenzene (106-46-7) **DOT EMERGENCY RESPONSE GUIDE:** #58

SYNONYMS: 1,4-Dichlorobenzene

ACGIH EXPOSURE LIMITS: TWA ppm: 75 mg/m^3: 450 A_1 or A_2: NO

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption (liquid)

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritant to eyes/URT, headache, periorbital swelling, profuse rhinitis, anorexia, nausea/vomiting, weight loss.

chronic: Cataracts

BIOL. FATE/METABOLITES: 2,5-Dichlorophenol excreted in the urine.

MEDICAL MONITORING: (Laboratory) Liver function tests/urine test for 2,5-dichlorophenol. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles; protective clothing and certified respirators in areas of concentration.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dichlorodifluoromethane (75-71-8) DOT EMERGENCY RESPONSE GUIDE: #12

SYNONYMS: Freon 12, FC-12

ACGIH EXPOSURE LIMITS: TWA ppm: 1,000 mg/m^3: 4,950 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Heart

EFFECTS OF EXPOSURE:

acute, accidental: Dizziness, cardiac arrhythmias with sudden death; unconsciousness; simple asphyxia; cardiac sensitization; fatalities with aerosol abuse.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None commonly used. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: None

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Generally not exceeded except for low oxygen content. Use SCBA.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1,1-Dichloroethane (75-34-3) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Ethylidene chloride

ACGIH EXPOSURE LIMITS: TWA ppm: 200 mg/m^3: 810 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: None

EFFECTS OF EXPOSURE:

acute, accidental: CNS depression; narcosis; skin irritation.

chronic: Slight burns; kidney/liver damage based on animal data.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Chlorinated solvents.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Certified respirator; chemical goggles and protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 2,2'-Dichloroethyl ether (111-44-4) **DOT EMERGENCY RESPONSE GUIDE:** #57

SYNONYMS: bis(2-chloroethyl) ether

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT LRT, Liver Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Severe eye and URT, follow by LRT irritation. Coughing and nausea is common.

chronic: Lung injury, eye and URT irritation may be present.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (*Laboratory*) Medical exam should include review of target organ manifestions.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	High exposure to animals over prolonged period caused some increase in tumors.
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator protection eye and skin; protective goggles and clothing are needed.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dichlorofluoromethane (75-43-4) DOT EMERGENCY RESPONSE GUIDE: #12

SYNONYMS: Dichloromonofluoromethane

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 40 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Liver, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Central nervous system as affected - narcosis is markedly present. Liver damage may occur quickly.

chronic: Cirrhosis may occur in moderate to high concentrations over a few weeks.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical examination should include review of target organs manifestations.

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respiratory devices should be available and used as needed.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dichloromethane (75-09-2) **DOT EMERGENCY RESPONSE GUIDE:** #74

SYNONYMS: Methylene Chloride

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 350 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis

chronic: Slight liver damage at high concentrations (>1000 ppm) over prolonged exposure.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respiratory protection.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1,2 dichloropropane (78-87-5) **DOT EMERGENCY RESPONSE GUIDE:** #27

SYNONYMS: Propylene dichloride, propylene chloride

ACGIH EXPOSURE LIMITS: TWA ppm: 75 mg/m^3: 350 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis, defatting of skin; moderately irritating to eyes, not permanent.

chronic: CNS, fatty degeneration of liver and kidneys occurred in animals.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None in common use; evaluate liver and renal functions on periodic basis.
Medical exam should review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Alcohol intake

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respirators in higher vapor concentrations.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1,3-dichloropropene (542-75-6) **DOT EMERGENCY RESPONSE GUIDE:** #29

SYNONYMS: 1,3-dichloropropylene

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, LRT, Liver, Kidneys

EFFECTS OF EXPOSURE: Skin

acute, accidental: Strong irritant, injury to target organs

chronic: Eyes, liver and kidneys, skin irritant

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organs manifestation

SYNERGISM OR ANTAGONISM: Chlorinated and brominated organic substances

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Complete protection for skin, eyes, URT and LRT; approved respirator.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 2,2-Dichloropropionic acid (75-99-0) DOT EMERGENCY RESPONSE GUIDE: #60

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 6 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes,URT,LRT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Can cause permanent eye injury; corrosive to the skin; irritating to respiratory and gastrointestinal systems.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles/gloves; protective clothing; approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dichlorotetrafluoroethane (76-14-2) **DOT EMERGENCY RESPONSE GUIDE:** #12

SYNONYMS: Refrigerant 114, fluorocarbon 114

ACGIH EXPOSURE LIMITS: TWA ppm: 1,000 mg/m^3: 7,000 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: URT

EFFECTS OF EXPOSURE: Skin

acute, accidental: Asphyxia, cardiac sensitization; liquid splash-frostbite of skin.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Normally not needed.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dicyclopentadiene (77-73-6) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: DCPD

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, Kidneys, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation to eyes; loss of coordination; convulsions, possible death; hemorrhage of lungs.

chronic: Possible kidney damage

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Kidney function tests. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing; chemical goggles, approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diethanolamine (111-42-2)

SYNONYMS: 2,2' - Iminodiethanol

ACGIH EXPOSURE LIMITS: TWA ppm: 3 mg/m^3: 15 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Direct contact - vision impairment.

chronic: Contact dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None in common use. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Barrier cream; gloves; approved respirator; chemical goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diethylamine (109-89-7) DOT EMERGENCY RESPONSE GUIDE: #68

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Kidneys, Heart, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Eye irritation; liquid causes severe skin and eye injury High concentrations will cause severe cough and chest pain, possible pulmonary edema. May cause skin burns. Corneal edema can result at vapor levels below irritant level, with foggy vision and haloes around lights.

chronic: Pulmonary edema may result from low level, prolonged exposure. Corneal edema; contact dermatitis; tracheitis, bronchitis, pneumonitis.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Electrocardiogram; arterial blood gases. Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing to prevent skin contact; approved full-face respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diethylene triamine (111-40-0) DOT EMERGENCY RESPONSE GUIDE: #29

SYNONYMS: 2,2'-Diaminodiethylamine, DETA

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 4 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Severe corneal injury; pulmonary & cutaneous sensitization.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	

MUTAGENICITY:		
human:		X
mammal:		X
microbe:		X

PERSONAL PROTECTIVE EQUIPMENT: Gloves; protective clothing; face protection goggles; approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diethyl phthalate (84-66-2)

SYNONYMS: Ethyl phthalate; DEP

ACGIH EXPOSURE LIMITS: TWA mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Narcotic effect; irritant to eyes and mucous membranes

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None commonly used; medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:

	Yes	No	Comments
human:		X	
animal:		X	

MUTAGENICITY:

human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diisobutyl ketone (108-83-8) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: Isovalerone

ACGIH EXPOSURE LIMITS: TWA ppm: 25 mg/m^3: 150 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Narcotic effects; headache, dizziness

chronic: Contact dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Skin barrier cream/gloves; protective clothing; approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diisopropylamine (108-18-9) **DOT EMERGENCY RESPONSE GUIDE:** #68

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 20 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin absorption

TARGET ORGAN OR SYMPTOM: LRT

EFFECTS OF EXPOSURE:

acute, accidental: Vision disturbances, cloudy swelling cornea, nausea, headache, pulmonary edema.

chronic: Pulmonary edema.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator, chemical goggles.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dimethyl acetamide (127-19-5)

SYNONYMS: Acetyl dimethylamine; DMA

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 35 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, Liver

EFFECTS OF EXPOSURE: Other

acute, accidental: Depression, lethargy, confusion, visual & auditory hallucinations, perceptual distortions, delusions.

chronic: Liver damage, jaundice

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None commonly used. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Gloves/protective clothing; approved organic vapor masks/respirators; chemical goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dimethylamine (124-40-3) **DOT EMERGENCY RESPONSE GUIDE:** #19

SYNONYMS: N - Methylmethanamine

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 18 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Irritant of eyes, mucous membranes, lungs. Corneal injury, permanent corneal opacity due to alkali burns unless flushed immediately with water & treated.

chronic: Contact dermatitis; conjuctivitis; may cause pulmonary edema; Hepatic injury from high exposures.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves; face protection; chemical goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dimethylformamide (68-12-2) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: DMF; DMFA

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: LRT, Liver, Kidneys, Blood

EFFECTS OF EXPOSURE:

acute, accidental: Damage to liver and kidneys; stomach pain, nausea and vomiting.

chronic: Liver damage is most often seen.

BIOL. FATE/METABOLITES: Monomethylformamide and DMF found in urine of exposed persons.

MEDICAL MONITORING: (Laboratory) Liver function. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Chlorinated hydrocarbons and ethanol.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing; chemical goggles and approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dimethylphthlate (131-11-3)

SYNONYMS: DMP

ACGIH EXPOSURE LIMITS: TWA mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: N/A

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: N/A
(Laboratory)

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Normally not needed

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dioxane (123-91-1) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 25 mg/m^3: 90 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: High concentrations of vapor are irritating.

chronic: Liver and kidney damage

BIOL. FATE/METABOLITES: High doses of dioxane by ingestion and inhalation causes tumors in animals. No human data following long exposure periods has been positive for carcinogenic effects.

MEDICAL MONITORING: (Laboratory) None specific. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator, gloves, goggles and protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diphenyl (92-52-4)

SYNONYMS: Biphenyl; phenylbenzene

ACGIH EXPOSURE LIMITS: TWA ppm: 0.2 mg/m^3: 1.5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys, CNS, PNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation to eyes and mucous membrane; headache; gastrointestinal symptoms; numbness and aching oflimbs; fatigue; liver and kidney damage; bronchitis; CNS.

chronic: Sensitization dermatitis; CNS and PNS

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Liver function tests. Medical exam should include review target organ manifestation.

SYNERGISM OR ANTAGONISM: High ambient temperatures

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: For URT and eye irritation approved cannister respirator, if needed.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Diphenylmethane di-isocyanate (101-68-8)

SYNONYMS: Methylene di-isocyanate; MDI; Methylene Bisphenyl Isocyanate

ACGIH EXPOSURE LIMITS: TWA ppm: C 0.02 mg/m^3: C 0.2 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Systemic

EFFECTS OF EXPOSURE:

acute, accidental: Delayed pulmonary edema - usually 4-8 hours. Nocturnal dyspnea and/or cough nausea, vomiting, abdominal pains.

chronic: Allergic sensitization of respiratory tract.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None in common use. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/goggles, full-face respirators.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Dipropylene Glycol monomethyl ether (34590-94-8)

SYNONYMS: DPGME, Dipropylene glycol methyl ether

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 600 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis, auricular fibrillation, depressed conduction and heart block -- eye, nasal and throat irritation.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: >100 ppm respirator of approved type.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Epichlorohydrin (106-89-8) **DOT EMERGENCY RESPONSE GUIDE:** #30

SYNONYMS: 1-chloro-2-3-epoxypropane

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 10 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Cyanosis; kidney lesions. Nausea, vomiting, abdominal pain. Delayed chemical pneumonitis, lung edema. Sensitization; skin irritation with deep pain.

chronic: Allergic eczematous contact dermatitis.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (*Laboratory*) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:	X		
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Rubber protective clothing. After exposure to > 2 ppm, respirators should be worn if needed.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethane (74-84-0) DOT EMERGENCY RESPONSE GUIDE: #22

SYNONYMS:

ACGIH EXPOSURE LIMITS: Simple Asphyxiant A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental: Simple asphyxiant; highly flammable

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: N/A
(Laboratory)

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: SCBA

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 2-Ethoxyethanol (110-80-5) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: Ethylene glycol monoethyl ether

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 185 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Kidneys, Testicles

EFFECTS OF EXPOSURE:

acute, accidental: Eye irritation; lung and kidney injury; increase in erythrocyte osmotic fragility. Genetic effect likely if pregnancy is present.

chronic: Lung and kidney injury; testicular atrophy, leukopenia.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Goggles/protective clothing. Respiratory protection if exposure likely.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

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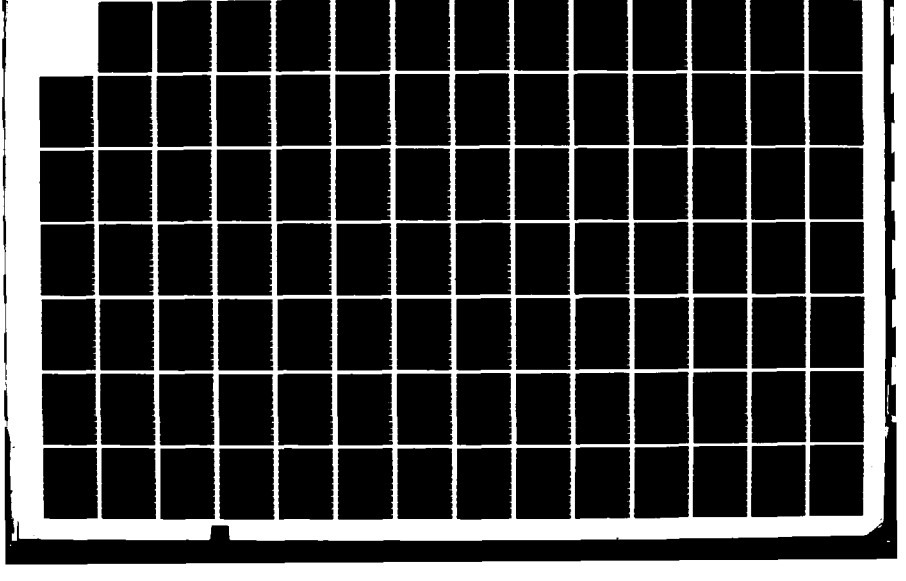

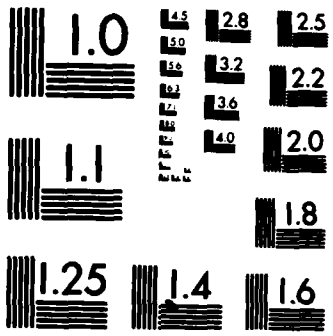

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BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 2-Ethoxyethyl acetate (111-15-9) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 270 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, LRT, CNS,Testicles

EFFECTS OF EXPOSURE:

acute, accidental: Irritation to eyes, nose and throat; CNS depression; kidney damage; genetic effect likely if pregnancy is present.

chronic: Testicular atrophy

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:	X		
animal:	X		
MUTAGENICITY:			
human:	X		
mammal:	X		
microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Goggles & protective clothing. Respiratory protection if exposure likely.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethyl acetate (141-78-6) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 400 mg/m^3: 1400 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Pulmonary irritation; narcosis, anemia, headache

chronic: Sensitization; secondary anemia with leucocytosis, hyperemia.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Barrier creams/gloves and protective clothing; full-face mask.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethyl acrylate (140-88-5) **DOT EMERGENCY RESPONSE GUIDE:** #27

SYNONYMS: Ethyl propenoate, acrylic acid, ethyl ester

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 20 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Kidneys

EFFECTS OF EXPOSURE: Heart

acute, accidental: Lacrimation; delayed pulmonary edema; eye, nasal and skin exposure.

chronic: LRT congestion, degenerative changes in liver, kidneys, and heart muscles.

BIOL. FATE/METABOLITES: Sensitization dermatitis.

MEDICAL MONITORING: (Laboratory) Degeneration of olefactory portion of nasal mucosa. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Barrier creams/gloves and protective clothing. Full-face approved respiratory equipment.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethyl alcohol (64-17-5) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: Ethanol, grain alcohol, Spirit of wine

ACGIH EXPOSURE LIMITS: TWA ppm: 1000 mg/m^3: 1900 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Intoxication; blood alcohol level

chronic: Dermatitis, headache, drowsiness, tremors, fatigue. Liver injury.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Liver function tests. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves and goggles where splash may occur.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylamine (75-04-7) **DOT EMERGENCY RESPONSE GUIDE:** #68

SYNONYMS: Monoethylamine

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 18 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Kidneys

EFFECTS OF EXPOSURE: Skin

acute, accidental: Severe pulmonary edema; alkali burns, eyes, skin irritation with extensive necrosis.

chronic: Dermatitis, eye irritation and corneal edema.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves and full-face approved respiratory equipment.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethyl amyl ketone (541-85-5) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: 5-Methyl-3-heptanone

ACGIH EXPOSURE LIMITS: TWA ppm: 25 mg/m^3: 130 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation,

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: CNS depression; headache and nausea, respiratory irritation, narcosis, transient eye irritation. Ataxia and LRT disease.

chronic: Exposure limit is based on degree of comfort--eyes and nasal irritation.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves and goggles in areas of high concentration.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylbenzene (100-41-4) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: Phenylethylene

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 435 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE: Skin

acute, accidental: Irritant to eyes, nose and throat. Constriction of chest, vertigo, CNS effects. Severe skin irritant.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing; goggles, approved respirator. >100 ppm wear cannister mask.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethyl chloride (75-00-3) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Chloroethane

ACGIH EXPOSURE LIMITS: TWA ppm: 1000 mg/m^3: 2600 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, CNS

EFFECTS OF EXPOSURE: Heart, Skin

acute, accidental: Anesthetic effect; potentiation of adrenalin and resultant cardiac arrhythmias; respiratory and cardiac arrest. Eye irritation, abdominal cramps, prolonged skin contact may cause frostbite.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves and goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylene (74-85-1) **DOT EMERGENCY RESPONSE GUIDE:** #22

SYNONYMS:

ACGIH EXPOSURE LIMITS: Simple Asphyxiant **A_1 or A_2:** No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental: Simple asphyxiant; highly flammable

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: N/A
(Laboratory)

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: SCBA

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylene chlorohydrin (107-07-3) **DOT EMERGENCY RESPONSE GUIDE:** #55

SYNONYMS: Glycol chlorohydrin

ACGIH EXPOSURE LIMITS: TWA ppm: C1 mg/m^3: C3 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritating to eyes, nose and throat. Nausea, vomiting, dizziness, headache. Little margin between early reversible symptoms and fatal intoxication.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Pulmonary function tests (FVC-FEV); chromatographic methods for presence in blood. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Toxicity reduced by administration of ethanol.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:			
microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves, goggles. The liquid rapidly penetrates rubber. Clothing should be discarded at first signs of deterioration. >1 ppm full-face approved cannister mask.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylenediamine (107-15-3) **DOT EMERGENCY RESPONSE GUIDE:** #29

SYNONYMS: 1,2-diaminoethane

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 25 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, Liver, Kidneys, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Irritation/blistering of the skin. Hypersensitivity, asthmatic-like symptoms; damage to liver and kidneys.

chronic: Cutaneous sensitivity
Sensitization dermatitis

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Liver/kidney function tests; patch test with 2% ethylenediamine in petrolatum. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing, gloves, goggles. >10 ppm, full-face approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylene dibromide (106-93-4) **DOT EMERGENCY RESPONSE GUIDE:** #55

SYNONYMS: 1,2-Dibromoethane

ACGIH EXPOSURE LIMITS: TWA ppm: -- mg/m^3: -- A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys, CNS, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Delayed skin erythema, blistering and ulcers. Irritation of eyes, causes liver/kidney damage, CNS depression, protracted vomiting, cardiac failure.

chronic: Lowered fertility

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Increased blood organic bromides. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:	X		Stomach
MUTAGENICITY:	human:		X	
	mammal:	X		
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Impermeable protective clothing. Full-face approved respiratory protection.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylene dichloride (107-06-2) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: 1,2-Dichloroethane

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 40 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Nausea, vomiting, mental confusion, dizziness, and pulmonary edema.

chronic: Has been associated with liver and kidney damage, CNS

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Liver function tests. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Ethyl alcohol

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:	X		

MUTAGENICITY:	Yes	No
human:		X
mammal:	X	
microbe:		X

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/goggles/gloves. >10 ppm full-face mask/supplied air respirators.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylene glycol (107-21-1)

SYNONYMS: 1,2-Ethanediol, glycol alcohol

ACGIH EXPOSURE LIMITS: TWA ppm: C 50 mg/m^3: C 125 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: LRT

EFFECTS OF EXPOSURE:

acute, accidental: Irritant - URT, eyes

chronic: Anorexia, oliguria, nystagmus, lymphocytosis.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Urinalysis for oxalic acid - useful in diagnosis of poisoning by oral ingestion. Medical exam should include review of target organs manifestations.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Mask should be worn in area of vapor concentration.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethylene oxide (75-21-8) **DOT EMERGENCY RESPONSE GUIDE:** #69

SYNONYMS: 1,2-Epoxyethane

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 2 A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, CNS, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Corrosive when in contact with skin and eyes in presence of moisture. Delayed severe pulmonary edema may occur.

chronic: Repeated skin contact may produce irritation or allergic eczematous dermatitis. Severe eye damage from liquid contact. Possible leukemia; asthma, pulmonary edema, pneumonia.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Severe exposures, hospitalization immediately for 72 hours. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:	X		
MUTAGENICITY:	human:	X		
	mammal:	X		
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Respirator to cover face and eyes; protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Ethyl ether (60-29-7) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: Ether

ACGIH EXPOSURE LIMITS: TWA ppm: 400 mg/m^3: 1,200 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: Vomiting, narcotic effect with unconsciousness.

chronic: N.A.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Chronic exposure may cause increased susceptibility to alcohol.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Barrier creams, gloves, protective clothing. Full-face respirator in areas of vapor concentrations.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Formaldehyde (50-00-0) DOT EMERGENCY RESPONSE GUIDE: #29

SYNONYMS: Oxomethane

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 1.5 A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritant to eyes and URT. Aqueous solution splashed in the eyes may cause eye burns.

chronic: Irritation or sensitization dermatitis

BIOL. FATE/METABOLITES: Methyl alcohol and formic acid excreted in urine.

MEDICAL MONITORING: None in common use.
(Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:	X		
MUTAGENICITY:	human:	X		
	mammal:	X		
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Barrier creams/protective clothing; approved respirator, goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Formamide (75-12-7)

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 20 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes

EFFECTS OF EXPOSURE:

acute, accidental: Low hazard.

chronic: Evidence of cumulative nature by gastritis and loss of weight.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	•
animal:		X	

MUTAGENICITY:		
human:		X
mammal:		X
microbe:		

PERSONAL PROTECTIVE EQUIPMENT: Goggles, respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Formic Acid (64-18-6) **DOT EMERGENCY RESPONSE GUIDE:** #60

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 9 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption, Ingestion

TARGET ORGAN OR SYMPTOM: Eyes, URT, GI

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritation to URT, eyes and skin.

chronic: Skin sensitization may occur in persons previously exposed to formaldehyde

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Formaldehyde

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator in areas of high vapor concentration. Chemical goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Furfural (98-01-1) DOT EMERGENCY RESPONSE GUIDE: #29

SYNONYMS: Furfurol, furfuraldehyde

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 8 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Irritation to eyes, URT, headache, pulmonary edema.

chronic: Liquid: skin. Contact: dermatitis and photosensitivity. Vapors: headache, fatigue, URT irritation.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:			

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves/goggles, vapor concentration wear full-face mask. Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Furfuryl alcohol (98-00-0) **DOT EMERGENCY RESPONSE GUIDE:** #55

SYNONYMS: 2-Furyl carbinol; 2-furanmethanol

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 40 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye absorption

TARGET ORGAN OR SYMPTOM: Eyes, LRT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis, confusion, depressed respirations and CNS, eye irritation.

chronic: N.A.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:			

PERSONAL PROTECTIVE EQUIPMENT: Gloves/goggles.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Gasoline (8006-61-9) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Petrol, motor spirits, benzine

ACGIH EXPOSURE LIMITS: TWA ppm: 300 mg/m^3: 900 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: URT

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis, irritant to URT, blurred vision, dizziness and nausea; chemical edema.

chronic: N.A.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:			

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Glutaraldehyde (111-30-8)

SYNONYMS: 1,5 Pentanedial

ACGIH EXPOSURE LIMITS: TWA ppm: C 0.2 mg/m^3: C 0.7 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Ingestion

TARGET ORGAN OR SYMPTOM: URT, Liver

EFFECTS OF EXPOSURE:

acute, accidental: Eyes, URT and skin; headache.

chronic: Allergic contact dermatitis

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing/gloves/goggles and approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Glycerine (56-81-5)

SYNONYMS: Glycerol

ACGIH EXPOSURE LIMITS: TWA ppm: mg/m^3: 10 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Low level of hazard

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: N/A
(Laboratory)

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Normally not needed

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Heptane (142-82-5) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: n-Heptane

ACGIH EXPOSURE LIMITS: TWA ppm: 400 mg/m^3: 1600 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: CNS depression, stupor; loss of appetite and nausea.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Hexane (110-54-3) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: n-Hexane

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 180 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS, PNS

EFFECTS OF EXPOSURE:

acute, accidental: CNS depression, nausea, stupor

chronic: Peripheral neuropathy, weakness of extensors with numbness.

BIOL. FATE/METABOLITES: 2-5 hexanedione is the neurotoxic agent.

MEDICAL MONITORING: (Laboratory) 2-5 hexanedione in urine. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Methylethyl ketone, methyl normal butyl ketone and triorthocresyl phosphate.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Hexyl Acetate (142-92-7)

SYNONYMS: Methyl isoamyl acetate

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 300 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT,

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis, irritation of eyes and URT

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical examination should include review of target organs manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: URT protection as needed for irritation goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

AGENT(CAS#): Hexylene glycol (107-41-5)

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: C 25 mg/m^3: C 125 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE:

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Eye irritation

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator. Chemical goggles, protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Hydrogen chloride (7647-01-0) **DOT EMERGENCY RESPONSE GUIDE:** #15

SYNONYMS: HCL, Muriatic acid

ACGIH EXPOSURE LIMITS: TWA ppm: C 5 mg/m^3: C 7 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Corrosive to eyes, skin and mucous membranes; severe eye and skin burns.

chronic: Headache, erosion of exposed teeth.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Pulmonary function testing/X-rays following acute over exposure. Medical exam should include review of target organ manifestations.

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator, acid resistant clothing gauntlets, apron and boots (where splashes/ spills of acid are likely), goggles and face shield.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Hydrogen fluoride (7664-39-3) DOT EMERGENCY RESPONSE GUIDE: #15

SYNONYMS: HF

ACGIH EXPOSURE LIMITS: TWA ppm: 3 mg/m^3: 2.5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: URT, Bone, Necrosis

EFFECTS OF EXPOSURE:

acute, accidental: Gas: severe respiratory irritant, transient choking and coughing; delayed (1-2 days) fever, cough, dyspnea, cyanosis and pulmonary edema. Solution: severe and painful corrosive burns of the skin and deep tissue. Severe eye injuries from splashes.

chronic: Increased radiographic density of bone; may cause crippling fluorosis (lumbar spine and pelvis). Necrosis of soft tissue.

BIOL. FATE/METABOLITES: High urinary excretion after significant exposure.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full body protection, gloves, full-face mask in areas of possible splashes.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Isoamyl acetate (123-92-2)

SYNONYMS: Banana oil

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 525 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes, nose, and throat; narcosis in high concentrations.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator in acute exposures. Protective equipment.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Isobutyl acetate (110-19-0) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 150 mg/m^3: 700 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: Eye and nose irritation and CNS depression at high concentration.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective equipment. Approved respirator in acute exposures.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Isobutyl alcohol (78-83-1) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 150 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental: Primarily skin irritation, but can cause CNS depression at high concentrations.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Isophorone (78-59-1)

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: C 5 mg/m^3: C 25 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Eyes, URT and skin severe irritation.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Severe exposure, hospitalization and observation for 72 hours for delayed severe lung edema. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face respirator; barrier creams and protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Isophorone diisocyanate **DOT EMERGENCY RESPONSE GUIDE:** #55

SYNONYMS: IPDI

ACGIH EXPOSURE LIMITS: TWA ppm: 0.01 mg/m^3: 0.09 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Eye and skin irritant

chronic: Bronchial asthma sensitizer

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator, gloves, goggles and apron.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

AGENT(CAS#): Isopropyl acetate (108-21-4) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 250 mg/m^3: 950 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritation of eyes and URT - narcosis.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical examination should include review of target organs manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Goggles and respiratory system protection.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Isopropyl alcohol (67-63-0) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: Isopropanol

ACGIH EXPOSURE LIMITS: TWA ppm: 400 mg/m^3: 980 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Potentially narcotic in high concentrations. Ingestion - CNS depression.

chronic: Dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) May be detected in blood, urine and body tissues. Medical exam should include review of target organ manifestations.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Barrier creams, protective clothing.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Isopropylamine (75-31-0) DOT EMERGENCY RESPONSE GUIDE: #68

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 12 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes, nose, throat, and skin. High levels may cause pulmonary edema; impaired vision; skin and eye burns.

chronic: Dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Severe exposure, hospitalization and observation for 72 hours for onset of severe pulmonary edema. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face respirator, protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Isopropyl ether (108-20-3) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: Di-isopropyl ether

ACGIH EXPOSURE LIMITS: TWA ppm: 250 mg/m^3: 1050 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes and URT. May cause CNS depression and narcosis.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:			
animal:			

MUTAGENICITY:
human:
mammal:
microbe:

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator and chemical goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Maleic anhydride (108-31-6) **DOT EMERGENCY RESPONSE GUIDE:** #6

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 0.25 mg/m^3: 1 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Severe eye and URT irritation with conjunctivitis, photophobia, double vision where high levels are inhaled; immediate hospitalization - observe for 72 hours for delayed onset of severe pulmonary edema. Sensitization and symptoms that mimic viral URT infection.

chronic: Asthma and bronchitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:			
animal:			

MUTAGENICITY:
human:
mammal:
microbe:

PERSONAL PROTECTIVE EQUIPMENT: Approved goggles and face shield with respirator. Full body impervious clothing in emergencies.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FCR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Mesityl oxide (141-79-7) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 15 mg/m^3: 60 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes and URT. May cause CNS depression and headache.

chronic: Irritation of eyes and URT, etc.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles, approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methacrylic acid (79-41-4) DOT EMERGENCY RESPONSE GUIDE: #60

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 20 mg/m^3: 70 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Vapor; eye irritation, URT.
Contact with liquid: blindness and skin corrosion.

chronic: Eye and skin irritation.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:			
animal:			

MUTAGENICITY:
human:
mammal:
microbe:

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles, protective clothing, face shield and approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methane (74-82-8) DOT EMERGENCY RESPONSE GUIDE: #22

SYNONYMS: Natural gas (85% CH_4)

ACGIH EXPOSURE LIMITS: Simple asphyxiant A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental: Simple asphyxiation; frostbite.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: N/A
(Laboratory)

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Fresh air supply in high concentrations.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl acetate (79-20-9) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 200 mg/m^3: 610 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes, URT and skin; CNS depression headache, and narcosis.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:			
animal:			

MUTAGENICITY:
human:
mammal:
microbe:

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl acetylene, propadiene mixture

DOT EMERGENCY RESPONSE GUIDE: #17

SYNONYMS: MAPP (see methyl acetylene)

ACGIH EXPOSURE LIMITS: TWA ppm: 1000 mg/m^3: 1800 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: CNS depressant at high, sustained concentrations liquefied material may cause frostbite.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respiratory protection in acute exposures.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl acrylate (96-33-3) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 35 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of URT, eyes, lacrimation

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) For severe exposure, hospitalization and observation for 72 hours for delayed onset of severe pulmonary edema is advised. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing, full-face approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl alcohol (67-56-1) **DOT EMERGENCY RESPONSE GUIDE:** #28

SYNONYMS: Methanol, wood alcohol

ACGIH EXPOSURE LIMITS: TWA ppm: 200 mg/m^3: 260 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye absorption

TARGET ORGAN OR SYMPTOM: Eyes, Optic nerve

EFFECTS OF EXPOSURE:

acute, accidental: Headache and blurred vision
If ingested: CNS depression, optic nerve damage resulting in blurring of vision, pain in eyes, loss of central vision, or blindness.

chronic: Loss of vision and headaches.

BIOL. FATE/METABOLITES: Metabolized to formic acid.

MEDICAL MONITORING: (Laboratory) Alkali reserve following accidental ingestion. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Barrier creams and protective clothing. Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methylamine (74-89-5) DOT EMERGENCY RESPONSE GUIDE: #68

SYNONYMS: mono-Methylamine

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 12 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritation; may cause pulmonary edema at high concentration; corrosive on skin, eyes and URT contact.

chronic: Dermatitis, conjunctivitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing; approved full-face respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl bromide (74-83-9) **DOT EMERGENCY RESPONSE GUIDE:** #55

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 20 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, CNS, PNS, SKin

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes and skin with itching dermatitis or corrosion. High concentrations: pulmonary edema, malaise, visual disturbances, somnolence, and tremor in hands.

chronic: CNS - Lethargy; muscular pains; visual, speech and sensory disturbances; mental confusion; convulsions; PNS.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) High levels of blood bromides, when no drugs are being taken. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:

	Yes	No	Comments
human:		X	
animal:		X	

MUTAGENICITY:

human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Rubber, not leather, protective clothing; full-face approved respirator.

REFERENCES:

NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl chloride (74-87-3) **DOT EMERGENCY RESPONSE GUIDE:** #18

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 105 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: CNS depression; bone marrow depression; a short latency period between exposure and frostbite from skin contact with pressurized gas. Observed effects - staggering gait, speech difficulty, nausea, headache, dizziness and blurred vision. There may be a latency period of several hours between exposure and observed effects.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator in high concentrations.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl ethyl ketone (78-93-3) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: MEK, butanone, 2-butanone

ACGIH EXPOSURE LIMITS: TWA ppm: 220 mg/m^3: 590 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Eye and throat irritation; acute exposure produces narcosis, with headache, nausea, incoordination, and unconsciousness.

chronic: N/A

BIOL. FATE/METABOLITES: Acetone in urine, blood and expired air has been used as index of exposure.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Methyl n-butyl ketone or hexane.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator for high concentration.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl formate (107-31-3) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 250 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Eye, URT irritation; oppression in chest; dyspnea; symptoms of CNS depression. Pulmonary edema at high levels.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator for areas of high vapor concentration.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl isobutyl carbinol (108-11-2) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: Methyl amyl alcohol

ACGIH EXPOSURE LIMITS: TWA ppm: 25 mg/m^3: 100 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, SKin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes,

EFFECTS OF EXPOSURE:

acute, accidental: Irritation, eye and URT. High concentration may cause signs and symptoms of CNS depression.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical splash goggles and approved respirator in acute exposure.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl isobutyl ketone (108-10-1) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: MIBK

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 205 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes, URT; high concentrations cause CNS depression.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing to prevent contact with skin and eyes; approved respirator for high vapor concentration.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Methyl methacrylate (80-62-6) **DOT EMERGENCY RESPONSE GUIDE:** #27

SYNONYMS: methacrylic acid

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 410 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes, URT, and skin

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing to prevent liquid contact with skin. Approved respirator in areas of acute exposure.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): alpha-Methylstyrene (98-83-9)

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 240 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Eye, URT and skin irritation.
At high concentrations, CNS depression.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing to prevent liquid contact with skin. Goggles and approved respirator in areas of acute exposure.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Morpholine (110-91-8) DOT EMERGENCY RESPONSE GUIDE: #29

SYNONYMS: Diethylene oxide

ACGIH EXPOSURE LIMITS: TWA ppm: 20 mg/m^3: 70 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of URT. Visual aberrations; corneal edema; cough; severe eye and skin irritation from liquid contact.

chronic: URT irritation

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Protective clothing to prevent liquid contact with skin. Goggles and approved respirator in areas of acute exposure.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Naphthalene (91-20-3) DOT EMERGENCY RESPONSE GUIDE: #32

SYNONYMS: $C_{10}H_8$

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 50 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys, CNS, Blood

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes and URT, headache and nausea.

chronic: High exposures may cause severe hemolytic anemia as well as liver and kidney damage.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical examination should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respirator and goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Nitric acid (7697-37-2) DOT EMERGENCY RESPONSE GUIDE: #44

SYNONYMS: HNO

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM:

EFFECTS OF EXPOSURE:

acute, accidental: Severe burns; ulcers; necrosis of the skin, mucous membranes and eyes. Severe exposure may cause chemical pneumonitis.

chronic: Chronic bronchitis; corrosion of teeth.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: Nonspecific
(Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Nitrogen dioxide

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Impervious clothing/gloves/ boots; full face shield/goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Nitrobenzene **DOT EMERGENCY RESPONSE GUIDE:** #55

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin Absorption

TARGET ORGAN OR SYMPTOM: Blood

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis and nausea, methemoglobin.

chronic: Anemia

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical examination should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Benzene and other chemicals with blood system damage should be avoided.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respiratory devices, goggles and skin protective clothing.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1-Nitropropane (108-03-2) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 25 mg/m^3: 90 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Eye irritation. Severe exposure may cause URT irritation, incoordination, ataxia, weakness; liver and kidney damage.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Aniline-type substances

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 2-Nitropropane (79-46-9) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 35 A_1 or A_2: A_2

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: URT, LRT, Liver, Kidneys, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Pulmonary irritation; headache, narcosis, vomiting, methemoglobin, liver and kidney damage.

chronic: Liver and kidney damage

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Aniline-type substances.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:	X		Rats--liver neoplasms
MUTAGENICITY:	human:		X	
	mammal:	X		
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Nitrotoluene (99-08-1) DOT EMERGENCY RESPONSE GUIDE: #55

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 11 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Blood

EFFECTS OF EXPOSURE:

acute, accidental: Methemoglobinemia, with symptoms of anoxia; headache cyanosis of lips, nose and ear lobes; anemia.

chronic: Anemia

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Nonane (111-84-2) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 200 mg/m^3: 1050 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: Caused respiratory failure onset at extremely high concentrations.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Octane (111-65-9) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 300 mg/m^3: 1450 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: At extremely high concentration: mucous membrane irritation, CNS depression and respiratory arrest.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Other petroleum substances

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

AGENT(CAS#): Mineral Oils

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Skin

EFFECTS OF EXPOSURE:

acute, accidental: N/A

chronic: Possible skin warts and tumors from some oils.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of targat organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	Warts and skin tumors
animal:		X	Associated with some cutting oil and machine lubricants.

MUTAGENICITY:		
human:		X
mammal:		X
microbe:		X

PERSONAL PROTECTIVE EQUIPMENT: Aprons and protective clothes where skin has prolonged contact with oils.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): n-Pentane (109-66-0) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Other petroleums

ACGIH EXPOSURE LIMITS: TWA ppm: 600 mg/m^3: 1800 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: URT

EFFECTS OF EXPOSURE:

acute, accidental: Mucous membrane irritation at high concentrations. Narcosis.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM:

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Fresh air mask in high concentrations.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Perchloroethylene (127-18-4) **DOT EMERGENCY RESPONSE GUIDE:** #74

SYNONYMS: Tetrachloroethylene

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 335 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Liver, Kidneys, CNS, Skin

EFFECTS OF EXPOSURE:

acute, accidental: May cause CNS depression, hepatic injury, and anesthetic death. Other signs include narcosis, dizziness, headache, increased perspiration, fatigue, ataxia, eye and nose irritation may result from high exposure.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Alcoholism may be a predisposing factor. Other chlorinated hydrocarbons.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Phenol (108-95-2) **DOT EMERGENCY RESPONSE GUIDE:** #55

SYNONYMS: Carbolic acid, monohydroxybenzene

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 19 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: LRT, Liver, Kidneys, CNS, Heart

EFFECTS OF EXPOSURE:

acute, accidental: General systemic intoxication by either skin contact or vapor inhalation. Severe damage is caused in liver, kidneys, lungs and heart.

chronic: Kidney and liver are most seriously damaged.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Blood level and urinary phenol, liver and kidney function tests.
Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Skin contact absorption

CARCINOGENICITY:

	Yes	No	Comments
human:		X	
animal:		X	

MUTAGENICITY:

human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator and adequate skin protective clothing.

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Phosphoric acid (7664-38-2) DOT EMERGENCY RESPONSE GUIDE: #60

SYNONYMS: H_3PO_4

ACGIH EXPOSURE LIMITS: TWA mg/m^3: 1 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritant to eyes, URT and skin.
Skin/eye burns from splashes of concentrated solutions.

chronic: Chronic dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: None specific
(Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Impervious clothing, gloves/boots, face shield/goggles.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Phthalic anhydride (85-44-9) **DOT EMERGENCY RESPONSE GUIDE:** #60

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 6 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Irritant of eyes, skin and URT. Sensitization of skin and LRT may be present.

chronic: Bronchial asthma; dermatitis; nasal ulceration and bleeding.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Chemical goggles, face shield and impervious gloves.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Propane (74-98-6) DOT EMERGENCY RESPONSE GUIDE: #22

SYNONYMS: LPG (liquefied petroleum gas)

ACGIH EXPOSURE LIMITS: Simple Asphyxiant A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: Simple asphyxiant; frostbite.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Fresh air mask in high concentrations.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Propionic acid (79-09-4) DOT EMERGENCY RESPONSE GUIDE: #29

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes and respiratory passages, skin burns.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved protective equipment.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): N-Propyl Acetate (109-60-4) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 200 mg/m^3: 840 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: CNS, Blood

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis and methemoglobin effects.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical examination should include review of target organ manifesation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respiratory protection and skin protection.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): n-Propyl alcohol (71-23-8) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 200 mg/m^3: 500 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, skin absorption

TARGET ORGAN OR SYMPTOM: CNS

EFFECTS OF EXPOSURE:

acute, accidental: Narcosis. Irritation of throat and eyes.

chronic: N/A

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Normally not needed

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Propylene glycol methyl ether (107-98-2)

SYNONYMS: Propylene glycol monomethyl ether

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 360 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, CNS, Other*

EFFECTS OF EXPOSURE:

acute, accidental: Irritant; severe exposure may cause anesthesia.

chronic: Reproductive effects. *Because of known adverse reproductive effects the ACGIH intends to set 5 ppm TLV in 1985.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respiratory protective equipment

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Propylene oxide (75-56-9) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: 1,2-epoxypropane; propene oxide; methyl oxirene

ACGIH EXPOSURE LIMITS: TWA ppm: 20 mg/m^3: 50 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT,

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritation of eyes, URT, and LRT, and skin.

chronic: Dermatitis

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: None in common use.
(Laboratory) Medical exam should include reviw of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: >20 ppm, goggles and respirator should be worn.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Pyridine (110-86-1) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: Azine

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 15 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, LIver, Kidneys, CNS, Blood, Bone Marrow

EFFECTS OF EXPOSURE:

acute, accidental: Headache, nervousness, dizziness, insomnia; nausea, anorexia; urinary frequency; skin irritation.

chronic: Dermatitis, skin sensitization, photosensitization, liver and kidney injury.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Liver and kidneys should be checked. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full protection for both respiratory system and skin if high levels are present.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Silica (14808-60-7)

SYNONYMS: Silicon dioxide, free SiO_2, sand, quartz, tripoli

ACGIH EXPOSURE LIMITS: TWA mg/m^3: 0.3 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: LRT

EFFECTS OF EXPOSURE:

acute, accidental: N/A

chronic: Silicosis, pulmonary fibrosis, normally years of exposure are required, but in very heavy dust clouds disease developes in less time.

BIOL. FATE/METABOLITES: Silica particles fill macrophages. Fibrosis becomes detectable by X-ray and lung function weakens.

MEDICAL MONITORING: (Laboratory) X-ray and pulmonary function tests. Nodular fibrosis, restrictive and/or obstructive as well as diffusion defects. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Tubercle bacilli

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved, filter respirator for short-period exposures; clean air supplied for long-period exposures.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Styrene (100-42-5) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Styrene monomer, phenyl ethylene

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 215 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritant to eyes, nose and throat; prolonged reaction time, decreased manual dexerity.

chronic: Toxic hepatitis, psychiatric disturbances.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Mandelic acid in urine measures intensity of styrene exposure. Medica exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Goggles/face shield/gloves and protective clothing. Approved respirator device.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Sulfur dioxide (7446-09-5) DOT EMERGENCY RESPONSE GUIDE: #16

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 5 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritation of eyes, nose, throat; choking, cough, reflex bronchoconstriction.

chronic: N.A.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) If severe exposure is suspected, hospitalization and observation for 72 hours for delayed onset of severe pulmonary edema are advisable. Pulmonary function tests. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Complete face and respiratory protective (SCBA) equipment.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Sulfuric acid (7664-93-9) **DOT EMERGENCY RESPONSE GUIDE:** #39

SYNONYMS: Oil of vitriol, hydrogen sulfate

ACGIH EXPOSURE LIMITS: TWA **mg/m^3:** 1 **A_1 or A_2:** No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes, URT and skin. Mist/vapor may cause teeth erosion, sore mouth, difficulty in breathing, pulmonary edema.

chronic: Dermatitis, erosion of the teeth, chronic inflammation of nose, throat and bronchial tubes.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) None commonly used. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Impervious clothing, gloves/shoes/full-face shield.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1,1,2,2-Tetrachloroethane (79-34-5) **DOT EMERGENCY RESPONSE GUIDE:** #55

SYNONYMS: Acetylene tetrachloride

ACGIH EXPOSURE LIMITS: TWA ppm: 1 mg/m^3: 7 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Severe irritation. Liver and Kidney damage may occur.

chronic: Liver effects most common in high prolonged exposure

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) Medical examination should include review of target organs manifestations.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respiratory device and eye skin protection.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Tetrahydrofuran (109-99-9) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: THF

ACGIH EXPOSURE LIMITS: TWA ppm: 200 mg/m^3: 590 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of eyes and upper respiratory tract; headache, nausea; dizziness, and other signs of CNS depression.

chronic: N.A.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) *Pulmonary function tests. Medical exam should include* review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face approved respiratory equipment in acute exposure and for escape

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Toluene (108-88-3) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Toluol, phenylmethane, methylbenzene

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 375 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS

EFFECTS OF EXPOSURE:

acute,. accidental: Irritation of eyes, respiratory tract and skin CNS depression. Headache, narcosis.

chronic: N/A

BIOL. FATE/METABOLITES: Hippuric acid in urine.

MEDICAL MONITORING: (Laboratory) Hippuric acid levels/urine
Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respirator - air supplied or gas mask with organic vapor cannister; impervious clothing, gloves.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#):Toluene-2,4-diisocyanate (584-84-9) DOT EMERGENCY RESPONSE GUIDE: #57

SYNONYMS: TDI

ACGIH EXPOSURE LIMITS: TWA ppm: .005 mg/m^3: 0.04 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Skin, Mucous Membrane

EFFECTS OF EXPOSURE:

acute, accidental: Irritation of nose and throat, paroxysmal cough, chest pain; nausea, bronchitis, pulmonary edema

chronic: Sensitization of skin and respiratory tract, dermatitis, asthma

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Pulmonary function tests. Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N.A.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	M
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved protective equipment for respiratory tract and skin.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): O-toluidine (95-53-4) DOT EMERGENCY RESPONSE GUIDE: #55

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 9 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Blood, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Causes anoxia due to methemoglobin. Headache, cyanosis of ears, eyes, and nose; eye burns. Symptoms similar to Aniline.

chronic: Anemia; hematuria.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Pulmonary function tests. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY: human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved protective equipment for both skin and respiratory tract.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1,2,4-Trichlorobenzene (120-82-1) **DOT EMERGENCY RESPONSE GUIDE:** #54

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: C 5 mg/m^3: C 40 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Liver, Kidneys, CNS

EFFECTS OF EXPOSURE:

acute, accidental: Irritant of eyes, throat, and skin. May produce liver and kidney damage.

chronic: Liver and kidneys, as well as other target organs should be tested or examined.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Alcohol

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Respiratory protection for all exposures of about 5 ppm.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1,1,2-Trichloroethane (79-00-5) **DOT EMERGENCY RESPONSE GUIDE:** #74

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 45 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Liver, Kidneys, CNS, Mucous Membrane

EFFECTS OF EXPOSURE:

acute, accidental: May cause irritation of eyes and nose; narcosis. Signs and symptoms of CNS depression and liver and kidney injury.

chronic: N.A.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: Alcohol

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved protective respiratory equipment.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Trichloroethylene (79-01-6) DOT EMERGENCY RESPONSE GUIDE: #74

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 270 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: URT, Liver, Kidneys, CNS, CVS, GI

EFFECTS OF EXPOSURE:

acute, accidental: Drowsiness, dizziness, tremor, loss of coordination, mental confusion, and coma; vomiting and abdominal cramps; cardiac arrhythmias; signs and symptoms of liver and kidney damage; respiratory tract irritation; skin irritation.

chronic: Liver and kidney damage; CNS and possible PNS.

BIOL. FATE/METABOLITES: Trichloroethanol and trichloroacetic acid in urine; breath analysis for trichloroethylene is a more accurate index of exposure.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: Alcohol and ultraviolet radiation and hot metal.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:	X		

MUTAGENICITY:	Yes	No
human:		X
mammal:		X
microbe:	X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respiratory device.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): 1,2,3-Trichloropropane (96-18-4)

SYNONYMS: Glycerol trichlorohydrin

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 300 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, Liver, Kidneys, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Eye, throat, and skin irritation; may cause signs and symptoms of CNS depression; liver and kidney damage may occur.

chronic: Liver and kidney damage.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include reivew of target organ manifestation

SYNERGISM OR ANTAGONISM: Alcohol

CARCINOGENICITY:		Yes	No	Comments
	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Triethylamine (121-44-8) DOT EMERGENCY RESPONSE GUIDE: #68

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 40 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, LRT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Causes eye, URT and LRT irritation and corneal edema.

chronic: Dermatitis; may cause pulmonary irritation.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) After severe exposure, observation for 72 hours for delayed onset of severe pulmonary edema is advisable. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM:

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face type respiratory protective equipment

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Trimethyl benzene (25551-13-7) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 25 mg/m^3: 125 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Liquid is a primary skin and eye irritant

chronic: May cause nervousness, tension, and anxiety; asthmatic bronchitis

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N.A.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face type approved protective equipment for respiratory tract.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Trimethyl Phosphite (121-45-9) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: TMP

ACGIH EXPOSURE LIMITS: TWA ppm: 2 mg/m^3: 10 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: URT, LRT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Can cause irritation and emphysematous changes in the lungs, skin irritation, and the liquid is a severe eye irritant

chronic: Emphysema, eczematoid dermatitis

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Anticholinesterase activity. Pulmonary function tests. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face type respiratory approved equipment

REFERENCES:
NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Triorthocresyl phosphate (78-30-8) DOT EMERGENCY RESPONSE GUIDE: #55

SYNONYMS: TOCP

ACGIH EXPOSURE LIMITS: TWA mg/m^3: 0.1 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: CNS, PNS, GI

EFFECTS OF EXPOSURE:

acute, accidental: Ingestion causes nausea, vomiting, diarrhea, and abdominal pain. Peripheral neuropathy may occur.

chronic: CNS; PNS

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Electromyograms may be useful. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-skin and respiratory protective equipment.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Turpentine (8006-64-2) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS:

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 560 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS, Mucous Membrane

EFFECTS OF EXPOSURE:

acute, accidental: Mucous membrane irritation; CNS depressant

chronic: N.A.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N.A.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face type approved respirator equipment in high concentrations

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

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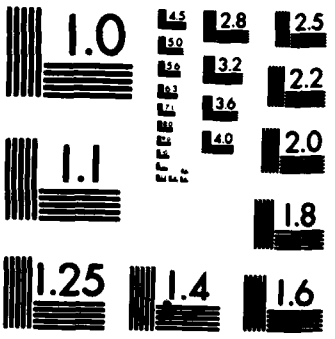

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): N-valeraldehyde (110-62-3) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: Pentanol

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 175 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation, Skin/eye Absorption

TARGET ORGAN OR SYMPTOM: Eyes, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Skin and eye irritant; considered relatively non-toxic systemically

chronic: Contact dermatitis

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Full-face approved respirator.

REFERENCES:

NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Vinyl acetate (108-05-4) DOT EMERGENCY RESPONSE GUIDE: #26

SYNONYMS: $CH_3COOCH\ CH_2$

ACGIH EXPOSURE LIMITS: TWA ppm: 10 mg/m^3: 30 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Skin

EFFECTS OF EXPOSURE:

acute, accidental: Olefactory fatigue
Severe irritation of skin with blistering

chronic: N.A.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) N.A. - Medical exam should include review of target organ manifestations.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator and protective clothing.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Vinyl chloride (75-01-4) **DOT EMERGENCY RESPONSE GUIDE:** #17

SYNONYMS: Chloroethylene

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 10 A_1 or A_2: A_1

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Liver, Kidneys, CNS, Blood

EFFECTS OF EXPOSURE:

acute, accidental: Liquid contact: severe eye irritation, skin irritation and possible frostbite on evaporation. CNS depression with narcosis.

chronic: Acro-osteolysis, Raynaud's phenomenon, sclerodermatous skin changes, hepatic damage; angiosarcoma of liver, cancer of lung, lymphatic, and nervous system.

BIOL. FATE/METABOLITES: N/A

MEDICAL MONITORING: (Laboratory) For liver tumors, hepatitis and acro-osteolysis. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N/A

CARCINOGENICITY:	Yes	No	Comments
human:	X		Recognized human carconigen
animal:	X		

MUTAGENICITY:		
human:	X	
mammal:	X	
microbe:	X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirator and proper protective clothing to prevent skin contact.

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Vinylidene chloride (75-35-4) **DOT EMERGENCY RESPONSE GUIDE:** #26

SYNONYMS: 1,1-dichlorothylene

ACGIH EXPOSURE LIMITS: TWA ppm: 5 mg/m^3: 20 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, Liver, Kidneys

EFFECTS OF EXPOSURE:

acute, accidental: Liquid causes transient irritation of eyes. High air concentrations are irritating to eyes and URT.

chronic: Several governmental agencies, both national and foreign, consider VDC to be carcinogenic.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING (Laboratory): Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: Alcohol

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:	X		Species: male rat
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Approved protection for eyes and respiratory tract

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Vinyl toluene (25013-15-4) **DOT EMERGENCY RESPONSE GUIDE:** #27

SYNONYMS: Methyl styrene

ACGIH EXPOSURE LIMITS: TWA ppm: 50 mg/m^3: 240 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, Liver, Kidneys, CNS, Mucous Membranes

EFFECTS OF EXPOSURE:

acute, accidental: Irritant of eyes and mucous membranes; severe exposure may cause CNS depression.

chronic: Liver and kidney damage.

BIOL. FATE/METABOLITES: N.A.

MEDICAL MONITORING: (Laboratory) Medical exam should include review of target organ manifestation

SYNERGISM OR ANTAGONISM: N.A.

		Yes	No	Comments
CARCINOGENICITY:	human:		X	
	animal:		X	
MUTAGENICITY:	human:		X	
	mammal:		X	
	microbe:	X		

PERSONAL PROTECTIVE EQUIPMENT: Approved protection for eyes and respiratory tract.

REFERENCES:

NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

BIOCHEMICAL AND MEDICAL INFORMATION
FOR MARINE HAZARDOUS SUBSTANCES

AGENT(CAS#): Xylene (1330-20-7) (mixed isomers) DOT EMERGENCY RESPONSE GUIDE: #27

SYNONYMS: Xylol, dimethylbenzene

ACGIH EXPOSURE LIMITS: TWA ppm: 100 mg/m^3: 435 A_1 or A_2: No

ROUTE OF ENTRY/EXPOSURE: Inhalation

TARGET ORGAN OR SYMPTOM: Eyes, URT, CNS, GI

EFFECTS OF EXPOSURE:

acute, accidental: High concentration of vapors is irritating to eyes, nose, and throat. CNS depression may occur and narcosis.

chronic: High vapor levels may cause injury to liver, kidneys, eyes, and CNS.

BIOL. FATE/METABOLITES: Hippuric acid.

MEDICAL MONITORING: (Laboratory) Liver and kidney functions. Medical exam should include review of target organ manifestation.

SYNERGISM OR ANTAGONISM: N.A.

CARCINOGENICITY:	Yes	No	Comments
human:		X	
animal:		X	
MUTAGENICITY:			
human:		X	
mammal:		X	
microbe:		X	

PERSONAL PROTECTIVE EQUIPMENT: Approved respirators, impervious clothing and gloves and goggles

REFERENCES: NIOSH Occupational Diseases (1977)
ACGIH TLV Booklet (1983-84)
ACGIH Documentation of TLVs (1981/82)
DOT P 5800.3 (1984)

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