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MATERIAL SAFETY DATA SHEET

No. 018

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| PRODUCT NAME Carbon Tetrachloride | CAS # 56-23-5 |
| TRADE NAME AND SYNONYMS Carbon Tetrachloride | DOT I.D. No.: UN 1846 RQ 10(4.54) |
| CHEMICAL NAME AND SYNONYMS Carbon tetrachloride (D.O.T.) | DOT Hazard Class: Div. 6.1, Pack. Group II |
| ISSUE DATES AND REVISIONS Revised April 1998 | Formula CCl ₄ |
| | Chemical Family: Chlorinated Hydrocarbon |

HEALTH HAZARD DATA

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| <p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT 5 Molar PPM and an A2 (Suspected human carcinogen) carcinogen rating with a skin notation and an STEL of (Continued on Page 4)</p> |
| <p>SYMPTOMS OF EXPOSURE Dizziness, disorientation, and in high concentrations of the vapor, eventual unconsciousness</p> |
| <p>TOXICOLOGICAL PROPERTIES Carbon tetrachloride can be absorbed through the skin or mucous membranes. Severe exposure produces damage to the kidneys, liver, and possibly the lungs and the vapors can be inhaled.</p> <p>IARC (RTECS) indicates both human limited evidence and human inadequate evidence for carbon tetrachloride as a carcinogen; also sufficient evidence for animals. OSHA 1989 does not list the product as a carcinogen or suspected carcinogen. NTP 1984 suggests that it meets the requirements for the proposed medical records rule.</p> <p>(Continued on Page 4)</p> |
| <p>RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO CARBON TETRACHLORIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.</p> <p><u>Inhalation:</u> Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.</p> <p><u>Ingestion:</u> If conscious, induce vomiting and continue until vomit is clear. A physician should see the patient promptly.</p> |

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use. Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

None

PHYSICAL DATA

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| BOILING POINT 170°F (76.5°C) | LIQUID DENSITY AT BOILING POINT 99.5 lb/ft ³ (1594 kg/m ³) |
| VAPOR PRESSURE @ 70°F (21.1°C): @ 73.5 F (23°C) = 1.9 psia (13 kPa) | GAS DENSITY AT 70°F, 1 atm .412 lb/ft ³ (6.6 kg/m ³) |
| SOLUBILITY IN WATER Insoluble | FREEZING POINT -9.4°F (-23°C) |
| EVAPORATION RATE 99.9+% volatile | SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 5.5 |
| APPEARANCE AND ODOR Colorless liquid emitting heavy vapors with strong ethereal odor | |

FIRE AND EXPLOSION HAZARD DATA

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| FLASH POINT (Method used) N/A | AUTO IGNITION TEMPERATURE N/A | FLAMMABLE LIMITS % BY VOLUME (See Page 4) LEL N/A UEL N/A |
| EXTINGUISHING MEDIA Nonflammable | ELECTRICAL CLASSIFICATION Nonhazardous | |
| SPECIAL FIRE FIGHTING PROCEDURES N/A | | |
| UNUSUAL FIRE AND EXPLOSION HAZARDS If Carbon Tetrachloride is involved in a fire, it may decompose yielding toxic products. | | |

REACTIVITY DATA

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| STABILITY Unstable | | CONDITIONS TO AVOID None |
| Stable | X | |
| INCOMPATIBILITY (Materials to avoid) Aluminum, zinc and alkali metals | | |
| HAZARDOUS DECOMPOSITION PRODUCTS When heated in air to decomposition, forms phosgene | | |
| HAZARDOUS POLYMERIZATION May Occur | | CONDITIONS TO AVOID None |
| Will Not Occur | X | |

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

Evacuate all personnel from a affected area. Use appropriate protective equipment. If leak is in use r's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.

WASTE DISPOSAL METHOD

Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to your supplier for proper disposal. For emergency disposal, contact your closest supplier location or call the emergency telephone number listed herein.

SPECIAL PROTECTION INFORMATION

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| RESPIRATORY PROTECTION (Specify type) | | Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use. (Continued on Page 4) | |
| VENTILATION Hood with forced ventilation | LOCAL EXHAUST To prevent accumulation above the TWA | SPECIAL | N/A |
| | MECHANICAL (Gen.) N/A | OTHER | N/A |
| PROTECTIVE GLOVES Plastic or Rubber | | | |
| EYE PROTECTION Safety goggles or glasses | | | |
| OTHER PROTECTIVE EQUIPMENT Safety shoes | | | |

SPECIAL PRECAUTIONS*

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| SPECIAL LABELING INFORMATION | |
| DOT Shipping Name: Carbon Tetrachloride | DOT Hazard Class: Div. 6.1, Pack. Group II |
| DOT Shipping Label: Poison | I.D. No.: UN 1846 (RQ 10/4.54) |
| SPECIAL HANDLING RECOMMENDATIONS Use only in well-ventilated areas. Do not drag, slide or roll containers. Use a suitable hand truck for container movement. Do not heat container by any means to increase the discharge rate of product from the container. | |
| SPECIAL STORAGE RECOMMENDATIONS Protect containers from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where containers are stored to exceed 130°F (54°C). Containers should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty containers should be segregated. Use a "first in - first out" inventory system to prevent full containers being stored for excessive periods of time. | |
| SPECIAL PACKAGING RECOMMENDATIONS None | |
| OTHER RECOMMENDATIONS OR PRECAUTIONS Keep containers closed when not in use. Do not use where heavy vapors can come in contact with open flames. | |

*Various Government Agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

Carbon Tetrachloride

HEALTH HAZARD DATA

TOXICOLOGICAL PROPERTIES: (Continued)

Persons in ill health where such illness would be aggravated by exposure to carbon tetrachloride should not be allowed to work with or handle this product.

TIME WEIGHTED AVERAGE EXPOSURE LIMIT: (Continued)

10 Molar PPM also with an A2 carcinogen rating (ACGIH 1997). OSHA 1995 lists a PEL (8 hr. TWA) of 10 Molar PPM and an acceptable ceiling concentration of 25 Molar PPM and an acceptable maximum peak above the acceptable ceiling concentration for an 8 hr. shift of 200 Molar PPM for 5 minutes in any 4 hours.

Carbon Tetrachloride is considered a toxic chemical and is subject to the reporting requirements of SARA, Title III, Section 313.