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THE POWER OF THREE³

PHARMCO-AAPER

AND COMMERCIAL ALCOHOLS

Product Information (203) 740-3471 / Emergency Assistance CHEMTREC 1-800-424-9300

MATERIAL SAFETY DATA SHEETS

Manufacturer: PHARMCO-AAPER
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DIMETHYLAMINOPROPYLAMINE

SECTION 1 MATERIAL IDENTIFICATION

PRODUCT NAME: DIMETHYLAMINOPROPYLAMINE
C.A.S. CHEMICAL NAME 109 55 7 DIMETHYLAMINOPROPYLAMINE
SYNONYMS: DMAPA
CHEMICAL FAMILY: Alkyldiamine
EMPIRICAL FORMULA: C₅H₁₄N₂
INTENDED USE: Chemical Intermediate

SECTION 2 INGREDIENTS

% CAS Number and Chemical Name
100 109 55 7 DIMETHYLAMINOPROPYLAMINE
OSHA (ACGIH) EXPOSURE LIMITS
CAS# TWO STEL CEILING
PPM mg/m³ PPM mg/m³ ppm mg/m³
109 55 7 N/E N/E N/E N/E N/E N/E
(N/E) (N/E) (N/E) (N/E) (N/E) (N/E)
N/E = Not Established. All values in () are U.S. ACGIH (American
Conf. of Gov. Indust. Hygienists) TLV; All others are OSHA PEL.

SECTION 3 HEALTH HAZARDS

EMERGENCY OVERVIEW

HMS HEALTH RATING 3 FLAMMABILITY 3 REACTIVITY 0
Mobile liquid, Colorless, Ammoniacal
Severe eye irritant; Severe skin irritant; Severe respiratory tract irritant; Corrosive
Liquid, Toxic (ANSI Z129.1 1988) by skin absorption.
Ignition will give rise to a Class B fire. In case of fire use: Carbon Dioxide (CO₂),
Dry Chemical, Alcohol Foam.

ROUTES OF EXPOSURE Ingestion, Skin Absorption, Inhalation, Eye Contact, Skin Contact
EXPOSURE STANDARDS No standards established for the product

HEALTH HAZARDS

Severe eye irritant, Severe skin irritant, Severe respiratory tract irritant, Corrosive Liquid, Toxic (ANSI Z129.1 1988) by skin absorption.

TARGET ORGANS

Eye

Respiratory system

Skin

SIGNS AND SYMPTOMS OF EXPOSURE (Acute effects)

Contact of undiluted product with eyes quickly causes severe irritation and pain and may cause burns, necrosis and permanent injury. Burns of the eye may cause blindness. Contact of undiluted product with skin quickly causes severe irritation and pain and may cause burns, necrosis and permanent injury.

Product vapor in low concentrations can cause lacrimation, conjunctivitis and corneal edema when absorbed into the tissue of the eye from the atmosphere. Corneal edema may give rise to a perception of "blue haze" or "fog" around lights. The effect is transient and has no known residual effect.

Inhalation of vapors may cause irritation in the respiratory tract. Coughing and chest pain may result.

Ingestion may cause: malaise, nausea, death unless treated promptly.

Product is readily absorbed through the skin and may cause malaise, discomfort, injury and death unless treated promptly.

SIGNS AND SYMPTOMS OF EXPOSURE (Possible Longer Term Effects)

Repeated and/or prolonged exposure to low concentrations of vapor may cause: sore throat, eye irritation, nausea, faintness, headache which are transient.

Repeated and/or prolonged exposures may result in: adverse respiratory effects (such as cough, tightness of chest or shortness of breath), adverse skin effects (such as defatting rash, irritation or corrosion), OR adverse eye effects (such as conjunctivitis or corneal damage).

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Asthma

Chronic respiratory disease (e.g. Bronchitis, Emphysema)

Eye disease

Skin disorders and Allergies

IRRITATION EFFECTS DATA

Severe irritant to the eyes of a rabbit. Corrosive to the skin of a rabbit.

ACUTE TOXICITY EFFECTS DATA

Oral LD50 (rat): 905 MG/KG

Dermal LD50 (rabbit): 500 1070 MG/KG

Inhalation LC50 (rat): >21 MG/L/1H

OTHER ACUTE EFFECTS

No Data

CHRONIC/SUBCHRONIC DATA

No delayed, subchronic or chronic test data are known.

SECTION 4 FIRST AID

EYE CONTACT

Hold eyelids apart and immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

SKIN CONTACT

Remove product and immediately flush affected area with water for at least 15 minutes. Except in the most minor, superficial and localized burns, cover the affected area with a sterile dressing or clean sheeting and transport for medical care. DO NOT APPLY

GREASES OR OINTMENTS. Control shock, if present. Launder contaminated clothing prior to reuse. Contaminated leather wear should be discarded. Victims of a major skin area contact should remain under medical observation for at least 24 hours due to possible delayed effects.

INHALATION

Move patient to fresh air. If breathing has stopped or is labored give assisted respiration (e.g.mouth to mouth). Supplemental oxygen may be indicated. Assure mucus does not obstruct airway

Prevent aspiration of vomit. Turn victim's head to the side.

Call a physician.

INGESTION

If swallowed, call a physician immediately. Remove stomach contents by gastric suction or induce vomiting only as directed by medical personnel. Never give anything by mouth to an unconscious person.

Note to physicians: This product is highly injurious to all tissues, similar to that of ammonia or ammonia gas. Chemical. pneumonitis, pulmonary edema, laryngeal edema and delayed scarring of the airway or other affected tissues may occur following exposure. There is no specific treatment. Clinical management is based on supportive treatment, which is similar to that for thermal burns.

SECTION 5 FIRE AND EXPLOSION DATA

CHARACTERISTICS:

Flash Point 35C (95F)
Flash Point Method(s) Closed cup
Upper Explosion Limit (UEL) 12.3%
Lower Explosion Limit (LEL) 2.3%
Autoignition Temperature 215C (419F)
Fire Hazard Classification (OSHA/NFPA)
Flammable Liquid, Class IC

EXTINGUISHING MEDIA

Ignition will give rise to a Class B fire. In case of fire use:
Carbon Dioxide (CO2), Dry Chemical, Alcohol Foam.

SPECIAL FIRE FIGHTING PROCEDURES

Firefighters should wear butyl rubber boots, gloves, and body suit and a self contained breathing apparatus. Water spray is also useful in cooling fire exposed tanks and in dispersing vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS

May generate ammonia gas. May generate carbon monoxide gas. May generate toxic nitrogen oxide gases.

SECTION 6 REACTIVITY HAZARD DATA

CHEMICAL STABILITY

Stable

CONDITIONS TO AVOID (if unstable)

Not applicable

INCOMPATIBILITY (Materials to Avoid)

Oxidizing Agents (i.e. perchlorates, nitrates etc.); Cleaning solutions, such as chromerge (sulfuric acid/dichromate) and aqua regia; Mineral acids (i.e. sulfuric, phosphoric, etc.)

A reaction accompanied by large heat release occurs when the product is mixed with acids. Heat generated may be sufficient to cause vigorous boiling creating a hazard due to splashing of splattering of hot material.

Product slowly corrodes copper, aluminum, zinc and galvanized surfaces.

CAUTION! N Nitrosamines, many of which are known to be potent carcinogens, may be formed when the product comes in contact with nitrous acid, nitrites or atmospheres with high nitrous oxide concentrations.

HAZARDOUS DECOMPOSITION PRODUCTS (from burning, heating, or, reaction with other materials)

Ammonia when heated. Carbon Monoxide in a fire. Nitrogen Oxides in a fire. Carbon Dioxide in a fire. Nitric acid in a fire.

Hydrogen Cyanide when heated.

nitriles, cyanic acid, isocyanates, cyanogens, nitrosamines, amides, carbamates.

HAZARDOUS POLYMERIZATION

Will not occur

CONDITIONS TO AVOID (if polymerization may occur)

Not applicable

SECTION 7 SPILL, LEAK AND WASTE DISPOSAL INFORMATION

CONTAINMENT TECHNIQUES (Removal of ignition sources, diking etc)

Shut off or remove all ignition sources Stop the leak, if possible.

Reduce vapor spreading with a water spray.

CLEAN UP PROCEDURES

Cover minor spills with sodium bisulfate to neutralize and reduce vapors.

Place in metal containers for recovery or disposal.

Clean up personnel must be equipped with self contained breathing apparatus and butyl rubber protective clothing.

OTHER EMERGENCY ADVICE

Avoid contamination of ground and surface waters.

Product is soluble in water.

Evacuate all personnel downwind from the spill.

WASTE DISPOSAL

Chemical and/or biological degradation is Feasible. A suitable industrial or municipal waste treatment system can be used depending on the quality and quantity of waste to be treated, the treatment plant capability, and discharge water quality standards.

Incineration is acceptable and the preferred method of disposal.

Incinerate in admixture with fuel equipped with a scrubber to remove nitrogen oxides.

Comply with all Federal, State and Local Regulations.

ENVIRONMENTAL EFFECTS

Waste from this product may present long term environmental hazards, thus landfill disposal must be considered less acceptable than incineration.

SECTION 8 PERSONAL PROTECTION/EXPOSURE CONTROLS

EYE PROTECTION

Splash proof eye goggles. In emergency situations, use eye goggles with a full face shield.

HAND PROTECTION Butyl rubber gloves.

RESPIRATORY PROTECTION

Chemical Cartridge Respirator with full face shield and cartridge to protect against the organic vapor, gas or dust involved under the following conditions: emergency situations, when product vapor concentration is greater than 20 ppm for a period longer than 15 minutes, during repair and cleaning of equipment, during transfer or discharge of the product.

PROTECTIVE CLOTHING

Butyl or latex protective clothing; full rubber suit (rain gear).

ENGINEERING CONTROLS

Maintain air concentrations in work spaces in accord with standards outlined In Sections 2 and WORK AND HYGIENIC PRACTICES

Provide readily accessible eyewash Stations; Safety shower.

SECTION 9 STORAGE AND HANDLING

STORAGE

Keep container closed.

Keep away from: heat, flames.

Store away from ignition sources. Ground all containers during transfer. Electrical installations should be in accordance with Article 501 of the National Electrical Code for Class I Division 2 locations.

Store in steel containers preferably located outdoors, above ground, and surrounded by dikes to contain spills or leaks. Protect containers against physical damage.

HANDLING

Avoid contact with skin or eyes. Avoid breathing of vapors.

Remove all equipment which may be a source of ignition from vicinity while handling. Smoking in area is prohibited.

Label empty tank cars "Dangerous Empty".

Empty containers may contain explosive vapors. Flush empty containers with Water to remove residual flammable liquid and vapors.

See "Flammable and Combustible Liquid Code" NFPA No. 30, National Fire Protection Association, Boston, MA.

OTHER PRECAUTIONS

Work areas must be well ventilated to maintain vapor concentration below a level, which is irritating. Emergency showers and eye wash stations should be readily accessible.

SECTION 10 TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL FORM Mobile liquid

COLOR Colorless

ODOR Ammoniacal

pH 11.7 1.0 % aqueous solution.

VAPOR PRESSURE (mm Hg) 18 @ 100F

VAPOR DENSITY (Air = 1) 3.5

BOILING POINT 135C (275F)

FREEZING/MELTING POINT Not applicable

SOLUBILITY IN WATER Miscible in all proportions

SPECIFIC GRAVITY (Water = 1) 0.8225

EVAPORATION RATE (Butylacetate) No Data

VISCOSITY (CPS) No Data

MOLECULAR WEIGHT 102

SECTION 11 TRANSPORTATION INFORMATION

DOT SHIPPING NAME Flammable Liquid/Corrosive N.O.S.,

(Dimethylaminopropylamine), UN2924

DOT Bulk Shipping Name

IMO SHIPPING DATA Corrosive liquid, Flammable, N.O.S.

(Dimethylaminopropylamine); Class 8;

UN2920

IMDG Code Page:: 8148; Packaging Group II

ICAO/IATA SHIPPING DATA Corrosive liquid, Flammable, N.O.S.

(Dimethylaminopropylamine); Class 8;

UN2920;

Packaging Group 11

SECTION 12 U.S. FEDERAL REGULATIONS

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components are included in the EPA Toxic Substances Control

Act (TSCA) Chemical Substance Inventory.

OSHA Hazard Communication Standard 129CFR1910.1200) hazard class(es)

Toxic by skin absorption. Corrosive; Flammable.

EPA SARA Title III Section 312 (40CFR370) hazard class
Immediate Health Hazard, Fire Hazard
EPA SARA Title III Section 313 (40CFR372) toxic chemicals above "de minimis" level are
None

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal or greater than the reportable quantities (RQs) in 40 CFR 302.4. Components present in this product at a level which could require reporting under the statute are: **NONE**

SECTION 13 STATE REGULATIONS

Proposition 65 substance(s) listed by the state of California under the "Safe Drinking Water and Toxic Enforcement Act of 1986, None

New Jersey Trade Secret Registry Number(s) None

SECTION 14 INTERNATIONAL REGULATIONS

CANADA DSL Included on Inventory

WHMIS Hazard Classification

Class B Division 2; Class D Division IB; Class E

Corrosive.

WHMIS Trade Secret Registry Number(s) None

WHMIS HAZARDOUS INGREDIENTS None

WHMIS Symbol

Test tube/hand, Flames

Included on Inventory

EEC SYMBOL

Harmful, Corrosive

EEC Council Directives relating to the classification, packaging and labeling of dangerous substances and preparations Risk (R) and Safety (S) phrases Flammable (R10).

Harmful in contact with skin and if swallowed (R21/22). Causes burns (R34). May cause sensitization by skin contact (R43). Do not breathe fumes (S23). In case of contact with eyes, rinse immediately with plenty of water and seek medical advice (S26). Wear suitable protective clothing, gloves and eye/face protection (S36/37/39).

SECTION 15 DISCLAIMERS

The information contained herein is based on data considered to be accurate based on the material as packaged. However, no warranty is expressed regarding the accuracy of these data or the results to be obtained from the use thereof. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It is the user's obligation to determine the conditions of safe use of the product. While this MSDS is based on technical data judged to be reliable, PHARMCO-AAPER assumes not responsibility for the completeness or accuracy of the information contained herein.