

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
959 ROUTE 46 EAST
PARSIPPANY, NEW JERSEY 07054-0624

EMERGENCY CONTACT:
CHEMTREC 1-800-424-9300
INFORMATION CONTACT:
973-257-1100

SUBSTANCE: PHOSPHINE

TRADE NAMES/SYNONYMS:

MTG MSDS 74; HYDROGEN PHOSPHIDE; CELPHOS; DELICIA; DETIA; DETIA GAS EX-B; GAS-EX-B; PHOSPHORUS TRIHYDRIDE; RCRA P096; UN 2199; MAT18680; RTECS SY7525000

CHEMICAL FAMILY: hydrides

CREATION DATE: Jan 24 1989

REVISION DATE: Mar 19 2003

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: PHOSPHINE

CAS NUMBER: 7803-51-2

PERCENTAGE: 100.0

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=4 REACTIVITY=2



EMERGENCY OVERVIEW:

COLOR: colorless

PHYSICAL FORM: gas

ODOR: unpleasant odor, fruity odor, garlic odor

MAJOR HEALTH HAZARDS: potentially fatal if inhaled, respiratory tract irritation, central nervous system depression

PHYSICAL HAZARDS: Flammable gas. May cause flash fire. Extremely flammable. May ignite spontaneously on exposure to air.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation, garlic odor, tearing, nausea, vomiting, diarrhea, stomach pain, difficulty breathing, irregular heartbeat, headache, drowsiness, symptoms of drunkenness, fainting, tingling sensation, visual disturbances, dilated pupils, bluish skin color, lung congestion, kidney damage, liver damage, paralysis, convulsions, coma, death

LONG TERM EXPOSURE: digestive disorders

SKIN CONTACT:

SHORT TERM EXPOSURE: blisters, frostbite

LONG TERM EXPOSURE: no information is available

EYE CONTACT:

SHORT TERM EXPOSURE: frostbite, blurred vision

LONG TERM EXPOSURE: no information is available

INGESTION:

SHORT TERM EXPOSURE: frostbite

LONG TERM EXPOSURE: no information is available

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

EYE CONTACT: Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If a large amount is swallowed, get medical attention.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. May ignite on exposure to air. Vapor/air mixtures are explosive. Containers may rupture or explode if exposed to heat.

EXTINGUISHING MEDIA: Let burn unless leak can be stopped immediately. Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile).

FLASH POINT: flammable
LOWER FLAMMABLE LIMIT: 1%
AUTOIGNITION: 212 F (100 C)

6. ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30).

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

PHOSPHINE:

0.3 ppm (0.4 mg/m³) OSHA TWA
1 ppm (1 mg/m³) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
0.3 ppm ACGIH TWA
1 ppm ACGIH STEL
0.3 ppm (0.4 mg/m³) NIOSH recommended TWA 10 hour(s)
1 ppm (1 mg/m³) NIOSH recommended STEL

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

EYE PROTECTION: For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: For the gas: Wear appropriate chemical resistant clothing. For the liquid: Wear appropriate protective, cold insulating clothing.

GLOVES: Wear insulated gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

3 ppm

Any supplied-air respirator.

7.5 ppm

Any supplied-air respirator operated in a continuous-flow mode.

15 ppm

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

50 ppm

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

Escape -

Any air-purifying respirator with a full facepiece and a canister providing protection against this substance.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: gas

COLOR: colorless

ODOR: unpleasant odor, fruity odor, garlic odor

MOLECULAR WEIGHT: 34.00

MOLECULAR FORMULA: P-H3

BOILING POINT: -126 F (-87.7 C)

FREEZING POINT: -208.3 F (-133.5 C)

DECOMPOSITION POINT: 1112 F (600 C)

VAPOR PRESSURE: 41.9 bar @ 20 C

VAPOR DENSITY (air=1): 1.17

DENSITY: Not available

WATER SOLUBILITY: 26% @ 17 C

PH: neutral in solution

VOLATILITY: Not applicable

ODOR THRESHOLD: 0.021 ppm

EVAPORATION RATE: Not applicable

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not applicable

SOLVENT SOLUBILITY:

Soluble: alcohol, ether, cuprous chloride solutions, cyclohexanol

10. STABILITY AND REACTIVITY

REACTIVITY: May ignite on exposure to air.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

INCOMPATIBILITIES: acids, halogens, oxidizing materials, halo carbons

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: oxides of phosphorus

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

PHOSPHINE:

TOXICITY DATA:

11 ppm/4 hour(s) inhalation-rat LC50

LOCAL EFFECTS:

Irritant: inhalation

ACUTE TOXICITY LEVEL:

Highly Toxic: inhalation

TARGET ORGANS: central nervous system

MUTAGENIC DATA: Available.

12. ECOLOGICAL INFORMATION

Not available

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): P096.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Phosphine



ID NUMBER: UN2199
HAZARD CLASS OR DIVISION: 2.3
LABELING REQUIREMENTS: 2.3; 2.1
QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: Forbidden
ADDITIONAL SHIPPING DESCRIPTION: Toxic-Inhalation Hazard Zone A

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Phosphine
UN NUMBER: UN2199
CLASS: 2.3; 2.1

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):
PHOSPHINE: 100 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):
PHOSPHINE: 500 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):
PHOSPHINE: 100 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No
FIRE: Yes
REACTIVE: Yes
SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):
PHOSPHINE

OSHA PROCESS SAFETY (29CFR1910.119):
PHOSPHINE: 100 LBS TQ

STATE REGULATIONS:

California Proposition 65: Not regulated.

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: ABD1

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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