

MATERIAL SAFETY DATA SHEET(MSDS)  
(COSMONATE M-200)

KUMHO MITSUI CHEMICALS, INC.

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## 1.CHEMICAL PRODUCT & COMPANY IDENTIFICATION

CAS NUMBER: 9016-87-9

RTECS NUMBER: TR0350000

SUBSTANCE: POLYMETHYLENE POLYPHENYL ISOCYANATE

### TRADE NAMES/SYNONYMS:

ISOCYANIC ACID, POLYMETHYLENEPOLYPHENYLENE ESTER;

POLYMETHYLENEPOLYPHENYLENE ESTER ISOCYANIC ACID;

POLYMETHYLENE POLYPHENYLISOCYANATE; PAPI; PMPPI; OHS19146

CHEMICAL FAMILY: Isocyanate

COMPANY : KUMHO MITSUI CHEMICALS INC., KOREA(82-061-688-5080)

CREATION DATE: 04/10/97

REVISION DATE: 04/10/97

## 2.COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT : METHYLENE BISPHENYL ISOCYANATE

CAS NUMBER: 9016-87-9

PERCENTAGE: 100

CONTAINS:

METHYLENE BISPHENYLISOCYANATE 40-60%

CAS NUMBER: 101-68-8

OTHER CONTAMINANTS: NONE

## 3.HAZARD IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=1 REACTIVITY=1

### EMERGENCY OVERVIEW:

Dark-amber to brown, viscous liquid with a characteristic earthy, musty odor.

May be fatal if inhaled. Causes respiratory tract, skin, and eye irritation.

May cause allergic reaction.

May react with water.

Poison. Do not breathe vapor or mist. Do not allow water to get in container. Avoid contact with eyes, skin and clothing. Avoid repeated or prolonged contact. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation. Handle with caution.

### POTENTIAL HEALTH EFFECTS:

**INHALATION:**

SHORT TERM EFFECTS: May be fatal if inhaled. May cause irritation. May cause allergic reactions. Additional effects may include fever, nausea, vomiting, chest pain, difficulty breathing, asthma, headache and lung congestion.

LONG TERM EFFECTS: Same effects as short term exposure.

**SKIN CONTACT:**

SHORT TERM EFFECTS: May cause irritation. May cause allergic reactions. Additional effects may include burns.

LONG TERM EFFECTS: In addition to effects from short term exposure, rash and itching may occur.

**EYE CONTACT:**

SHORT TERM EFFECTS: May cause irritation. Additional effects may include eye damage.

LONG TERM EFFECTS: Same effects as short term exposure.

**INGESTION:**

SHORT TERM EFFECTS: May cause nausea, vomiting, diarrhea, stomach pain, irregular heartbeat, blood disorders and coma.

LONG TERM EFFECTS: No information is available.

**CARCINOGEN STATUS:**

OSHA: N

NTP: N

IARC: N

## **4.FIRST AID MEASURES**

**INHALATION:**

FIRST AID- Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

**SKIN CONTACT:**

FIRST AID- Remove contaminated clothing and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

**EYE CONTACT:**

FIRST AID- Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical

remains (at least 15-20 minutes). Get medical attention immediately.

**INGESTION:**

FIRST AID- If vomiting occurs, keep head lower than hips to help prevent aspiration. Treat symptomatically and supportively. Get medical attention if needed.

**NOTE TO PHYSICIAN**

**ANTIDOTE:**

No specific antidote. Treat symptomatically and supportively.

## **5.FIRST FIGHTING MEASURES**

**FIRE AND EXPLOSION HAZARD:**

Slight fire hazard when exposed to heat or flame.

**EXTINGUISHING MEDIA:**

Dry chemical, carbon dioxide, water spray or regular foam  
(1993 Emergency Response Guidebook, RSPA P 5800.6).

For larger fires, use water spray, fog or regular foam  
(1993 Emergency Response Guidebook, RSPA P 5800.6).

**FIREFIGHTING:**

Move container from fire area if you can do it without risk. Do not scatter spilled material with high-pressure water streams. Dike fire-control water for later disposal (1993 Emergency Response Guidebook, RSPA P 5800.6, Guide Page 31).

Use agents suitable for type of surrounding fire. Avoid breathing hazardous vapors, keep upwind.

**FLASH POINT:** 350-425°F (177-218°C )

**LOWER FLAMMABLE LIMIT:** no data available

**UPPER FLAMMABLE LIMIT:** no data available

**AUTOIGNITION:** no data available

**FLAMMABILITY CLASS(OSHA):** IIIB

**HAZARDOUS COMBUSTION PRODUCTS:**

Thermal decomposition products may include highly toxic fumes of hydrogen cyanide and toxic oxides of carbon and nitrogen.

## **6.ACCIDENTAL RELEASE MEASURES**

**OCCUPATIONAL SPILL:**

Stop leak if you can do it without risk. For small spills, take up with sand or other absorbent material and place into clean, dry containers for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry.

**7. HANDLING AND STORAGE**

Observe all federal, state and local regulations when storing this substance.

Store in a cool, dry, well-ventilated area between 35–125°F, out of direct sunlight.

Store away from incompatible substances.

**8. EXPOSURE CONTROLS, PERSONAL PROTECTION****EXPOSURE LIMITS:****POLYMETHYLENE POLYPHENYL ISOCYANATE:**

Subject to SARA Section 313 Annual Toxic Chemical Release Reporting

**METHYLENE BISPHENYL ISOCYANATE:**

0.02 ppm (0.2 mg/m<sup>3</sup>) OSHA ceiling

0.005 ppm (0.051 mg/m<sup>3</sup>) ACGIH TWA

0.005 ppm (0.051 mg/m<sup>3</sup>) NIOSH recommended 10 hour TWA;

0.02 ppm (0.2 mg/m<sup>3</sup>) NIOSH recommended 10 minute ceiling

0.01 ppm (0.1 mg/m<sup>3</sup>) DFG MAK TWA (sensitization);

0.02 ppm (0.2 mg/m<sup>3</sup>) DFG MAK 5 minute peak, momentary value, 8 times/shift

Measurement method: Bubbler; acetylate; high-pressure liquid chromatography with ultraviolet detection; (NIOSH III # 5521, Isocyanates).

5000 pounds CERCLA Section 103 Reportable Quantity

Subject to SARA Section 313 Annual Toxic Chemical Release Reporting

**VENTILATION:**

Provide local exhaust ventilation system to meet published exposure limits.

**EYE PROTECTION:**

Employee must wear splash-proof or dust-resistant safety goggles and a faceshield to prevent contact with this substance.

**Emergency wash facilities:**

Where there is any possibility that an employee's eyes and/or skin may be exposed to this substance, the employer should provide an eye wash fountain

and quick drench shower within the immediate work area for emergency use.

**CLOTHING:**

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

**GLOVES:**

Employee must wear appropriate protective gloves to prevent contact with this substance.

**RESPIRATOR:**

The following respirators and maximum use concentrations are recommendations by the U.S. Department of Health and Human Services, NIOSH Pocket Guide to Chemical Hazards; NIOSH criteria documents or by the U.S. Department of Labor, 29 CFR 1910 Subpart Z.

The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

**METHYLENE BISPHENYL ISOCYANATE:**

0.5 mg/m<sup>3</sup>– Any supplied-air respirator.

1.25 mg/m<sup>3</sup>– Any supplied-air respirator operated in a continuous flow mode.

2.5 mg/m<sup>3</sup>– Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

75 mg/m<sup>3</sup>– Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Escape– Any air-purifying, full facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having a high- efficiency particulate filter.

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

**FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:**

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

## 9. PHYSICAL & CHEMICAL PROPERTIES

**DESCRIPTION:** Dark-amber to brown, viscous liquid with a characteristic earthy, musty odor.

**MOLECULAR WEIGHT:** 350~400

**MOLECULAR FORMULA:**  $C_6H_4(NCO)CH_2C_6H_4(NCO)(C_8H_5NO)_X$

**BOILING POINT:** 392–406°F (200–208°C )

**FREEZING POINT:** <50 °F (<10 °C)

**VAPOR PRESSURE:** negligible @ 25°C

**VAPOR DENSITY:** no data available

**SPECIFIC GRAVITY:** 1.23 @ 25 °C

**WATER SOLUBILITY:** reacts

**PH:** no data available

**ODOR THRESHOLD:** 0.4 ppm

**EVAPORATION RATE:** no data available

**VISCOSITY:** 150~220 cP @ 25 °C

**SOLVENT SOLUBILITY:** Soluble in benzene, nitrobenzene, acetone, chlorinated benzene, and kerosene.

## 10. STABILITY & REACTIVITY

### REACTIVITY:

#### POLYMETHYLENE POLYPHENYL ISOCYANATE:

Reacts slowly and exothermically on contact with water, generating sufficient heat and pressure to rupture the container in a closed system. Above 50°C, reaction may be vigorous.

### CONDITIONS TO AVOID:

May burn but does not ignite readily. Avoid contact with strong oxidizers, excessive heat, sparks, or open flame.

### INCOMPATIBILITIES:

#### POLYMETHYLENE POLYPHENYL ISOCYANATE:

**ACIDS:** May react violently with generation of heat.

**ALCOHOLS:** Violent explosion in absence of inert diluent.

**ALUMINUM:** May cause some corrosion.

**AMINES:** May react violently with generation of heat.

**BASES:** May react violently with generation of heat.

**COPPER (ALLOYS):** May cause some corrosion.

**METAL COMPOUNDS:** Incompatible.

**ORGANOTIN COMPOUNDS:** Incompatible.



OXIDIZERS (STRONG): Fire and explosion hazard.

PLASTICS AND RUBBER MATERIALS: May attack and embrittle.

SURFACE-ACTIVE AGENTS: Incompatible.

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products may include highly toxic fumes of hydrogen cyanide and toxic oxides of carbon and nitrogen.

**POLYMERIZATION:**

POLYMETHYLENE POLYPHENYL ISOCYANATE:

Polymerization may occur at temperatures greater than 204 °C (400 °F), or upon contact with incompatible materials. Pressure build-up in closed containers and explosive rupture are possible.

## **11. TOXICOLOGICAL INFORMATION**

POLYMETHYLENE POLYPHENYL ISOCYANATE:

TOXICITY DATA: >9400 mg/kg skin-rabbit LD50; >10 gm/kg oral-rat LD50; >5 mL/kg skin-rabbit LD50 (Cheminfo); >10,000 mg/kg oral-rat LD50 (Cheminfo).

CARCINOGEN STATUS: Human no adequate data, Animal no adequate data (IARC Group-3).

LOCAL EFFECTS: Irritant- inhalation, skin, eye.

ACUTE TOXICITY LEVEL: Slightly toxic by dermal absorption and ingestion.

TARGET EFFECTS: Sensitizer- respiratory, dermal. Poisoning may affect the lungs.

ADDITIONAL DATA: Cross sensitization may occur with methylene bisphenyl isocyanate and other isocyanates.

METHYLENE BISPHENYL ISOCYANATE:

IRRITATION DATA: 500 mg/24 hours skin-rabbit; 100 ug eye-rabbit mild.

TOXICITY DATA: 130 ppb/30 minutes inhalation-human TCLo; 178 mg/m<sup>3</sup> inhalation-rat LC50; >7.9 g/kg skin-rabbit LD50 (Conap MSDS); 31,690 mg/kg oral-rat LDLo; 2200 mg/kg oral-mouse LD50; mutagenic data (RTECS).

CARCINOGEN STATUS: Human Inadequate Evidence, Animal Inadequate Evidence (IARC Group-3).

LOCAL EFFECTS: Irritant- inhalation, skin, eye.

ACUTE TOXICITY LEVEL: Highly toxic by inhalation; moderately toxic by ingestion; slightly toxic by dermal absorption.

TARGET EFFECTS: Sensitizer- respiratory, dermal.

ADDITIONAL DATA: Cross-sensitization reactions may occur with other isocyanates.

## **HEALTH EFFECTS**

### **INHALATION:**

POLYMETHYLENE POLYPHENYL ISOCYANATE:

IRRITANT/SENSITIZER.

ACUTE EXPOSURE- May cause respiratory tract irritation, chest discomfort, breathlessness, wheezing, cough with sputum, and reduced pulmonary function. Other effects may include headache, nausea, fever, depression and insomnia. High levels may produce chemical pneumonitis, inflammation and pulmonary edema which may be fatal. Symptoms may be delayed for several hours. Sensitization reactions, including severe asthmatic reactions, may occur in previously exposed persons.

CHRONIC EXPOSURE- Prolonged or repeated exposure may result in sensitization.

METHYLENE BISPHENYL ISOCYANATE:

IRRITANT/SENSITIZER/HIGHLY TOXIC.

75 mg/m<sup>3</sup> Immediately Dangerous to Life or Health.

ACUTE EXPOSURE- May cause irritation of the nose and throat. Depending on the length and concentrations of exposure (above 0.5 ppm), respiratory symptoms may develop with a latent period of four to eight hours. Symptoms may include coughing and dyspnea, especially prominent in the evenings, with progression of asthmatic bronchitis and wheezing. Other symptoms may include headache, nausea, vomiting, chest pain, pulmonary secretions, pulmonary edema and possible death. A human exposed to 130 ppb for 30 minutes experienced an increase in immune response and body temperature.

CHRONIC EXPOSURE- After months of exposure, allergic sensitization of the respiratory tract may occur. Symptoms, which include nocturnal dyspnea, nocturnal cough and asthmatic bronchitis, become progressively more pronounced with continued exposure.

### **SKIN CONTACT:**

POLYMETHYLENE POLYPHENYL ISOCYANATE:

IRRITANT/SENSITIZER.

ACUTE EXPOSURE- Liquid may cause irritation and possible first degree burns. Second degree burns may occur from longer exposures.

CHRONIC EXPOSURE- May cause inflammation, rash and itching. Sensitization has been reported to occur in humans. Dark stains on the hands may occur temporarily.

METHYLENE BISPHENYL ISOCYANATE:

IRRITANT/SENSITIZER.

ACUTE EXPOSURE- May irritate the skin causing redness, pain, contact eczema and follicular papules.

CHRONIC EXPOSURE- May cause sensitization dermatitis.

**EYE CONTACT:**

POLYMETHYLENE POLYPHENYL ISOCYANATE:

IRRITANT.

ACUTE EXPOSURE- Liquid, vapor, and mist may cause irritation, watering and discomfort. Corneal damage may also occur.

CHRONIC EXPOSURE- Effects may be similar as in acute exposure.

METHYLENE BISPHENYL ISOCYANATE:

IRRITANT.

ACUTE EXPOSURE- May cause irritation with redness, pain, and blurred vision.

CHRONIC EXPOSURE- Repeated and prolonged contact with irritants may cause conjunctivitis.

**INGESTION:**

POLYMETHYLENE POLYPHENYL ISOCYANATE:

ACUTE EXPOSURE- May cause irritation of the mouth and stomach. Ingestion of 60 ml of a liquid containing polymethylene polyphenyl isocyanate resulted in coma, bradycardia, temporary apnea, leucocytosis, and acidosis. Diarrhea, abdominal cramps, bloody, watery stools, and vomiting of rock-hard whitish fragments from isocyanate polymerization developed. Early hemolysis and intravascular clotting also occurred.

May also cause corrosion of the mouth, throat and digestive tract.

CHRONIC EXPOSURE- No data available.

**METHYLENE BISPHENYL ISOCYANATE:**

ACUTE EXPOSURE- May irritate the gastrointestinal tract causing nausea, vomiting, and abdominal spasms.

CHRONIC EXPOSURE- No data available.

## **12.ECOLOGICAL INFORMATION**

**ENVIRONMENTAL IMPACT RATING (0-4):** no data available

**ACUTE AQUATIC TOXICITY:** no data available

**DEGRADABILITY:** no data available

**LOG BIOCONCENTRATION FACTOR (BCF):** no data available

**LOG OCTANOL/WATER PARTITION COEFFICIENT:** no data available

## **13.DISPOSAL CONSIDERATION**

Observe all federal, state and local regulations when disposing of this

substance.

#### 14. TRANSPORT INFORMATION

No classification currently assigned

#### 15. REGULATORY INFORMATION

TSCA INVENTORY STATUS: Y

CERCLA SECTION 103 (40CFR302.4): Y

METHYLENE BISPHENYL ISOCYANATE 5000 pounds RQ

SARA SECTION 302 (40CFR355.30): N

SARA SECTION 304 (40CFR355.40): N

SARA SECTION 313 (40CFR372.65): Y

POLYMETHYLENE POLYPHENYL ISOCYANATE

METHYLENE BISPHENYL ISOCYANATE

OSHA PROCESS SAFETY (29CFR1910.119): N

CALIFORNIA PROPOSITION 65: N

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)

ACUTE HAZARD: Y

CHRONIC HAZARD: Y

FIRE HAZARD: N

REACTIVITY HAZARD: Y

SUDDEN RELEASE HAZARD: N

#### 16. OTHER INFORMATION