

MATERIAL SAFETY DATA SHEET (MSDS) - ISOPROPYL ETHER

1 . PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: ISOPROPYL ETHER

Product Description: Ether

Intended Use: Solvent

COMPANY IDENTIFICATION

Supplier:

Pure Chemicals Group.

CHENNAI, TAMILNADU, INDIA

24 Hour Health Emergency

(91) 8939878447

(91) 9444038694

Transportation Emergency Phone

(91) 8939768680

| Company Name | Place | EMERGENCY TELEPHONE NUMBER |
|-----------------------|-------|---------------------------------------|
| Pure Chemicals Group. | India | Day Emergency – 044-26161803-26161809 |

2 .COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

| Name | CAS# | Concentration* |
|-----------------|----------|----------------|
| ISOPROPYL ETHER | 108-20-3 | > 99.0% |

* All concentrations are percent by weight unless material is a gas. Gas concentrations are in percent by volume.

3. HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

POTENTIAL PHYSICAL / CHEMICAL EFFECTS

Flammable. May form explosive peroxides. Material can release vapors that readily form flammable mixtures. Vapor accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an ignition.

POTENTIAL HEALTH EFFECTS

Repeated exposure may cause skin dryness or cracking. If swallowed, may be

aspirated and cause lung damage. May cause central nervous system depression.

NFPA Hazard ID: Health: 1 Flammability: 3 Reactivity: 0

HMIS Hazard ID: Health: 1 Flammability: 3 Reactivity: 0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

4. FIRST AID MEASURES

Inhalation

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight Streams of Water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a leak. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Firefighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water

spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Extremely Flammable. Vapors are flammable and heavier than air. Vapors may travel across the ground and reach remote ignition sources causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

Hazardous Combustion Products: Smoke, Fume, Incomplete combustion products, Oxides of carbon.

FLAMMABILITY PROPERTIES

Flash Point [Method]: -28C (-18F) [ASTM D-56]

Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.9

Autoignition Temperature: 443°C (829°F)

6. ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Use clean non-sparking tools to collect absorbed material. Large Spills: Water spray may reduce vapor; but may not prevent ignition in closed spaces.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dike far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

7. HANDLING AND STORAGE

HANDLING

Avoid contact with skin. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Use only with adequate ventilation. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation. Consult local applicable standards for guidance.

Loading/Unloading Temperature: [Ambient]

Transport Temperature: [Ambient]

Transport Pressure: [Ambient]

Static Accumulator: This material is a static accumulator. A liquid is typically considered a nonconductive, static accumulator if its conductivity is below 100 pS/m (100×10^{-12} Siemens per meter) and is considered a semiconductive, static accumulator if its conductivity is below 10,000 pS/m. Whether a liquid is nonconductive or semiconductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, anti-static additives and filtration can greatly influence the conductivity of a liquid.

STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. The container choice, for example storage vessel, may effect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage

containers should be grounded and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

Storage Temperature: [Ambient]

Storage Pressure: [Ambient]

Suitable Containers/Packing: Tank Cars; Tank Trucks; Drums; Pipelines

Suitable Materials and Coatings (Chemical Compatibility): Carbon Steel; Butyl Rubber; CAF Joints

Unsuitable Materials and Coatings: Natural Rubber

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

| Source | Form | Limit / Standard | | | NOTE | Source |
|-----------------|------|------------------|------------------------|---------|------|---------|
| ISOPROPYL ETHER | | TWA | 2100 mg/m ³ | 500 ppm | N/A | OSHA Z1 |
| ISOPROPYL ETHER | | STEL | 310 ppm | | N/A | ACGIH |
| ISOPROPYL ETHER | | TWA | 250 ppm | | N/A | ACGIH |

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Adequate ventilation should be provided so that exposure limits are not exceeded. Use explosion-proof ventilation equipment.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Half-face filter respirator

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapor warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical/oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

9. PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid

Form: Clear

Color: Colorless

Odor: N/D

Odor Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 20 C): 0.724

Flash Point [Method]: -28C (-18F) [ASTM D-56]

Flammable Limits (Approximate volume % in air): LEL: 1.4 UEL: 7.9

Autoignition Temperature: 443°C (829°F)

Boiling Point / Range: 68C (154F)

Vapor Density (Air = 1): 3.5 at 101 kPa

Vapor Pressure: 15.96 kPa (120 mm Hg) at 20 C | 34.3 kPa (257.25 mm Hg at 38C

Evaporation Rate (n-butyl acetate = 1): 8.4

pH: N/A

Log Pow (n-Octanol/Water Partition Coefficient): N/D

Solubility in Water: Appreciable

Viscosity: [N/D at 40 °C]

Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: -60°C (-76°F)

Melting Point: N/A

Molecular Weight: 102.2

Coefficient of Thermal Expansion: 0.00103 V/VDEGC

10. STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions. Forms peroxide unless inhibited.

CONDITIONS TO AVOID: Do not evaporate to dryness. Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Air, Caustics, Amines, Alkanolamines, Strong oxidizers, Chlorinated Compounds, Aldehydes, Acids

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

| <u>Route of Exposure</u> | <u>Conclusion / Remarks</u> |
|------------------------------------|--|
| Inhalation | |
| Toxicity: Data available. | May cause central nervous system effects. Based on available literature |
| Irritation: Data available. | Negligible hazard at ambient/normal handling temperatures. Based on available literature |
| Ingestion | |
| Toxicity (Rabbit): LD50 5-6.5 g/kg | Minimally Toxic. Based on available literature |

| | |
|-------------------------------------|--|
| Skin | |
| Toxicity (Rabbit): LD50 > 3.16 g/kg | Minimally Toxic. Based on available literature |
| Irritation: Data available. | Mildly irritating to skin with prolonged exposure. Based on available literature |
| Eye | |
| Irritation: Data available. | May cause mild, short-lasting discomfort to eyes. Based on available literature |

CHRONIC/OTHER EFFECTS

For the product itself:

Vapor concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.

Prolonged and/or repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis.

Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

Diisopropyl ether (DIPE) : Inhalation exposure of animals to DIPE produced decreased motor activity, maternal toxicity, and toxicity to the fetus of laboratory animals.

Additional information is available by request.

The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--

1 = NTP CARC
2 = NTP SUS

3 = IARC 1
4 = IARC 2A

5 = IARC 2B
6 = OSHA CARC

12. ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

MOBILITY

Material -- Expected to partition to water. Some partitioning to sediment and wastewater solids. Minimally volatile.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to biodegrade slowly.

Hydrolysis:

Material -- Transformation due to hydrolysis not expected to be significant.

Photolysis:

Material -- Transformation due to photolysis not expected to be significant.

Atmospheric Oxidation:

Material -- Expected to degrade rapidly in air

13. DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

RCRA Information: Disposal of unused product may be subject to RCRA regulations (40 CFR 261). Disposal of the used product may also be regulated due to ignitability, corrosivity, reactivity or toxicity as determined by the Toxicity Characteristic Leaching Procedure (TCLP). Potential RCRA characteristics: IGNITABILITY.

Empty Container Warning :Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

14. TRANSPORT INFORMATION

LAND (DOT)

Proper Shipping Name: DIISOPROPYL ETHER

Hazard Class & Division: 3

ID Number: 1159

Packing Group: II

ERG Number: 127

Label(s): 3

Transport Document Name: UN1159, DIISOPROPYL ETHER, 3, PG II

LAND (TDG)

Proper Shipping Name: DIISOPROPYL ETHER

Hazard Class & Division: 3

UN Number: 1159

Packing Group: II

SEA (IMDG)

Proper Shipping Name: DIISOPROPYL ETHER

Hazard Class & Division: 3

EMS Number: F-E, S-D

UN Number: 1159

Packing Group: II

Label(s): 3

Transport Document Name: UN1159, DIISOPROPYL ETHER, 3, PG II, (-
27.8°C c.c.)

AIR (IATA)

Proper Shipping Name: DIISOPROPYL ETHER

Hazard Class & Division: 3

UN Number: 1159

Packing Group: II

Label(s) / Mark(s): 3

Transport Document Name: UN1159, DIISOPROPYL ETHER, 3, PG II

15. REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD: When used for its intended purpose, this material is classified as hazardous in accordance with OSHA 29CFR 1910.1200.

NATIONAL CHEMICAL INVENTORY LISTING: AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

EPCRA: This material contains no extremely hazardous substances.

SARA (311/312) REPORTABLE HAZARD CATEGORIES: Fire.

SARA (313) TOXIC RELEASE INVENTORY: This material contains no chemicals subject to the supplier notification requirements of the SARA 313 Toxic Release Program.

The following ingredients are cited on the lists below:

| Chemical Name | CAS Number | List Citations |
|-----------------|------------|--------------------------|
| ISOPROPYL ETHER | 108-20-3 | 1, 4, 13, 16, 17, 18, 19 |

--REGULATORY LISTS SEARCHED--

| | | | |
|---------------|------------------|-------------------|-------------|
| 1 = ACGIH ALL | 6 = TSCA 5a2 | 11 = CA P65 REPRO | 16 = MN RTK |
| 2 = ACGIH A1 | 7 = TSCA 5e | 12 = CA RTK | 17 = NJ RTK |
| 3 = ACGIH A2 | 8 = TSCA 6 | 13 = IL RTK | 18 = PA RTK |
| 4 = OSHA Z | 9 = TSCA 12b | 14 = LA RTK | 19 = RI RTK |
| 5 = TSCA 4 | 10 = CA P65 CARC | 15 = MI 293 | |

Code key: CARC=Carcinogen; REPRO=Reproductive

16. OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

Section 04: First Aid Inhalation - Header was modified.

Section 04: First Aid Ingestion - Header was modified.

Section 06: Notification Procedures - Header was modified.

Section 10 Stability and Reactivity - Header was modified.

Section 13: Disposal Recommendations - Note was modified.

Section 11: Inhalation Lethality Conclusion was modified.

Section 08: Personal Protection was modified.

Section 08: Hand Protection was modified.

Section 07: Handling and Storage - Handling was modified.

Section 07: Handling and Storage - Storage Phrases was modified.

Hazard Identification: Health Hazards was modified.

Hazard Identification: Physical/Chemical Hazard was modified.

Section 07: Loading/Unloading Temperature C(F) was modified.

Section 07: Transport Temperature C(F) was modified.

Section 07: Transport Pressure kPa was modified.

Section 07: Storage Temperature C(F) was modified.

Section 07: Storage Pressure kPa was modified.

Section 07: Static Accumulator was modified.

Section 07: Suitable Materials and Coatings - Header was modified.

Section 05: Hazardous Combustion Products was modified.

Section 09: Relative Density - Header was modified.

Section 09: Viscosity was modified.

Section 08: Hand Protection was modified.

Section 08: Skin and Body Protection was modified.

Section 14: Sea (IMDG) - Header was modified.

Section 14: Label(s) - Header was modified.

Section 15: List Citation Table - Header was modified.

Section 16: Code to MHCs was modified.

Section 16: Precautions was modified.

Section 16: Physical Hazards additional was modified.

Section 08: Exposure limits/standards was modified.

Section 06: Notification Procedures was modified.

Section 09: Oxidizing Properties was modified.

Section 08: OEL Table - Notation Column - Header was modified.

Section 08: Exposure Limit Values - Header was modified.

Section 12: Ecological Information - Acute Aquatic Toxicity was added.

Section 12: Ecological Information - Acute Aquatic Toxicity was added.

Section 01: Product Code - Header was deleted.

Section 12: Ecological Information - Acute Aquatic Toxicity was deleted.

Section 12: Ecological Information - Acute Aquatic Toxicity was deleted.

PRECAUTIONARY LABEL TEXT:

Contains: ISOPROPYL ETHER

DANGER!

HEALTH HAZARDS

Repeated exposure may cause skin dryness or cracking. If swallowed, may be aspirated and cause lung damage.

PHYSICAL HAZARDS

Flammable Gas. May form explosive peroxides. Material can accumulate static charges which may cause an ignition.

PRECAUTIONS

Avoid contact with skin. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapors may be evolved from heated or agitated material. Use only with adequate ventilation. Use proper bonding and/or ground procedures. However, bonding and grounds may not eliminate the hazard from static accumulation.

FIRST AID

Inhalation: Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

Eye: Flush thoroughly with water. If irritation occurs, get medical assistance.

Oral: Seek immediate medical attention. Do not induce vomiting.

Skin: Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

FIRE FIGHTING MEDIA

Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

SPILL/LEAK

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Use clean non-sparking tools to collect absorbed material.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do it without risk. Do not confine in area of spill. Advise occupants and shipping in downwind areas of fire and explosion hazard and warn them to stay clear. Allow liquid to evaporate from the surface. Report spills as required to appropriate authorities. Seek the advice of a specialist before using dispersants.

Disclaimer:

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