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ISO 9001: 2015

MATERIAL SAFETY DATA SHEET

1. Identification

1.1 GHS Product identifier
1,1,1-Trichloroethane, 98%
Code T 2043

2. Hazard identification

2.1 Classification of the substance or mixture
Acute toxicity - Inhalation, Category 4
Hazardous to the ozone layer, Category 1
2.2 GHS label elements, including precautionary statements
Pictogram(s)



Signal word Warning
Hazard statement(s) H332 Harmful if inhaled
H420 Harms public health and the environment by destroying ozone in the upper atmosphere

Precautionary statement(s)
Prevention

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTER/doctor if you feel unwell.

Response

Storage
Disposal

none
P502 Refer to manufacturer or supplier for information on recovery or recycling

2.3 Other hazards which do not result in classification
none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
1,1,1-trichloroethane	1,1,1-trichloroethane	71-55-6	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

In case of skin contact

Remove contaminated clothes. Rinse and then wash skin with water and soap.

In case of eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

If swallowed

Do NOT induce vomiting. Rinse mouth. Give a slurry of activated charcoal in water to drink. Refer for medical attention.

4.2 Most important symptoms/effects, acute and delayed

INHALATION: symptoms range from loss of equilibrium and incoordination to loss of consciousness; high concentration can be fatal due to simple asphyxiation combined with loss of consciousness. INGESTION: produces effects similar to inhalation and may cause some feeling of nausea. EYES: slightly irritating and lachrymatory. SKIN: defatting action may cause dermatitis. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Emergency and supportive measures: 1. Maintain an open airway and assist ventilation if necessary. Administer supplemental oxygen and treat hydrocarbon aspiration pneumonitis if it occurs. 2. Treat seizures, coma, and arrhythmias if they occur. Caution: Avoid the use of epinephrine or other sympathomimetic amines because of the risk of inducing or aggravating cardiac arrhythmias. Tachyarrhythmias caused by myocardial sensitization may be treated with propranolol ... or esmolol 3. Monitor for a minimum of 4-6 hours after significant exposure. /Trichloroethane, trichloroethylene, and tetrachloroethylene/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

DRY CHEMICAL, FOAM, OR CARBON DIOXIDE

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic and irritating gases are generated in fires. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Personal protection: self-contained breathing apparatus. Ventilation. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Environmental considerations: land spill: Dig a pit, pond, lagoon, holding area to contain liquid or solid material. /SRP: If time permits, pits, ponds, lagoons, soak holes, or holding areas should be sealed with an impermeable flexible membrane liner./ Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete. Absorb bulk liquid with fly ash, cement powder, or commercial sorbents.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Separated from food and feedstuffs, strong oxidants, aluminium, magnesium and zinc. Cool. Dry. Store in an area without drain or sewer access. Storage temp: Ambient; Venting: Pressure-vacuum.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Recommended Exposure Limit: 15-Min Ceiling Value: 350 ppm (1900 mg/cu m).

NIOSH considers 1,1,1-trichloroethane to be a potential occupational carcinogen.

NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible concentration.

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state colourless liquid with a mild ether-like odour

Colour Colorless liquid

Odour ... Mild chloroform-like odor

Melting point/ freezing point -33\00baC

Boiling point or initial boiling point and

boiling range
 Flammability Combustible Liquid, but burns with difficulty. Combustible under specific conditions. Heating will cause rise in pressure with risk of bursting. Gives off irritating or toxic fumes (or gases) in a fire. See Notes.

Lower and upper explosion limit / flammability limit Lower flammable limit: 7.5% by volume; Upper flammable limit: 12.5% by volume

Flash point 11°C

Auto-ignition temperature 500°C (USCG, 1999)

Decomposition temperature no data available

pH no data available

Kinematic viscosity 0.00086 Pa.s at 20°C

Solubility In water: 1.4 g/L (20°C)

Partition coefficient n-octanol/water (log value) log Kow = 2.49

Vapour pressure 100 mm Hg (20°C)

Density and/or relative density 1.3376

Relative vapour density 4.6 (vs air)

Particle characteristics no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

It burns only in excess of oxygen or in air if a strong source of ignition is present. The vapour is heavier than air. 1,1,1-TRICHLOROETHANE decomposes in the presence of chemically active metals. This includes aluminum, magnesium and their alloys. It will react violently with dinitrogen tetroxide, oxygen, liquid oxygen, sodium and sodium-potassium alloys. It will also react violently with acetone, zinc and nitrates. It can react with sodium hydroxide. It is incompatible with strong oxidizers and strong bases. Mixtures with potassium or its alloys are shock-sensitive and may explode on light impact. This chemical can react with an aqueous suspension of calcium hydroxide, and with chlorine in sunlight. It will attack some forms of plastics, rubber and coatings. Upon contact with hot metal or on exposure to ultraviolet radiation, it will decompose to form irritant gases. A cobalt/molybdenum-alumina catalyst will generate a substantial exotherm on contact with its vapor at ambient temperatures. Hazardous reactions also occur with (aluminum oxide + heavy metals).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Reacts slowly with water, releasing corrosive hydrochloric acid.

10.6 Hazardous decomposition products

When heated to decomposition, it emits irritating gases and toxic fumes of carbon monoxide, carbon dioxide, hydrogen chloride gas, chlorine, and phosgene.

11. Toxicological information

Acute toxicity

Oral: LD50 Rat oral 10.3-12.3 g/kg

Inhalation: LC50 Rat inhalation 24,000 ppm/1 hr

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Cancer Classification: Group D Not Classifiable as to Human Carcinogenicity

Reproductive toxicity

Epidemiologic studies have found no relationship between adverse pregnancy outcomes and exposure of mothers or fathers to methyl chloroform. Animal studies have not reported developmental or reproductive effects from exposure to methyl chloroform.

STOT-single exposure

no data available

STOT-repeated exposure
no data available
Aspiration hazard
no data available

12. Ecological information

12.1 Toxicity

Toxicity to fish: EC50; Species: Pimephales promelas (Fathead minnow) weight 1.04 g, length 49.0 mm; Conditions: freshwater, static, 12\u00b0C, pH 7.8-8.0, dissolved oxygen > or =5.0 mg/L; Concentration: 12100 ug/L for 24 hr (10900-13500 ug/L); Effect: intoxication, immobilization

Toxicity to daphnia and other aquatic invertebrates: EC50; Species: Daphnia magna (Water flea) age <24 hr; Conditions: freshwater, static; Concentration: 11.2 ppm for 48 hr (9.7-12.8 ppm); Effect: intoxication, immobilization /96.4% purity

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: No degradation was observed in subsurface soils in 27 weeks of incubation; however, in loamy sand, slow degradation was observed under acclimated conditions(1,2). Slow degradation may occur in water under anaerobic or aerated conditions; degradation may take several weeks and acclimation is important(3,4). In seawater, a half-life of 9 months has been determined and vinylidene chloride is the degradation product(5). No degradation in river water was found(6). No utilization of 1,1,1-trichloroethane occurred in a continuously-fed aerobic biofilm reactor that utilized acetate as its primary substrate; however, 98% removal was obtained in a similar anaerobic reactor with a 2-day retention time after 8 wk acclimation(8). 1,1,1-Trichloroethane degraded to vinylidene chloride as a first step in its biotransformation in microcosms containing aquifer water and sediment collected from uncontaminated sites in the Everglades(7); considerable degradation occurred within two weeks(7). Field evidence of biodegradation in aquifers was obtained by following the concentration of 1,1,1-trichloroethane in a confined aquifer after it was injected with reclaimed groundwater(8); the half-life of 1,1,1-trichloroethane was 231 days with biodegradation given as the probable cause of loss(8). The biodegradation half-life of 1,1,1-trichloroethane in non-adapted aerobic soils from Louisiana and Oklahoma were reported as >97 days and >485 days, respectively(9). 1,1,1-Trichloroethane at 100 mg/L achieved 0% of its theoretical BOD using an activated sludge inoculum at 30 mg/L over a 2 week incubation period in the Japanese MITI test(10).

12.3 Bioaccumulative potential

A BCF range of 0.7 to 4.9 was measured using carp (*Cyprinus carpio*) which were exposed over an 6-week period(1). A BCF of 8.9 was determined in bluegill sunfish (*Lepomis macrochirus*) in a 28 day test(2). A BCF of 2.95 was measured in killfish (*Oryzias latipes*) over an 8-day exposure period(3). According to a classification scheme(4), these BCF values suggest that bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

The adsorption of 1,1,1-trichloroethane was studied using three US soils(1); equilibrium adsorption coefficients (Kd) of 1.8, 1.592, and 1.338 were measured using a soil from Missouri (11.4% sand, 52.7% silt, 33.4% clay, 2.4% organic matter), California (45.1% sand, 35.2% silt, 21.7% clay, 1.7% organic matter) and Florida (9.17% sand, 6.3% silt, 2% clay, 1.6% organic matter), respectively(1); these adsorption coefficients correspond to Koc values of 120 (Missouri soil), 151 (California soil) and 135 (Florida soil). A Koc value of 66 was reported for 1,1,1-trichloroethane in an unspecified soil(2). According to a classification scheme(3), these Koc values suggests that 1,1,1-trichloroethane is expected to have high mobility in soil(SRC).

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN2831 IMDG: UN2831 IATA: UN2831

14.2 UN Proper Shipping Name

ADR/RID: 1,1,1-TRICHLOROETHANE

IMDG: 1,1,1-TRICHLOROETHANE

IATA: 1,1,1-TRICHLOROETHANE

14.3 Transport hazard class(es)

ADR/RID: 6.1 IMDG: 6.1 IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: III IMDG: III IATA: III

14.5 Environmental hazards

ADR/RID: no IMDG: no IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
1,1,1-trichloroethane	1,1,1-trichloroethane	71-55-6	none
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

Section 16: Other Information

This safety data sheet should be used in conjunction with technical sheets. It does not replace them. The information given is based on our knowledge of this product, at the time of publication. It is given in good faith. The attention of the user is drawn to the possible risks incurred by using the product for any other purpose other than that for which it was intended. This does not in any way excuse the user from knowing and applying all the regulations governing his activity. It is the sole responsibility of the user to take all precautions required in handling the product. The aim of the mandatory regulations mentioned is to help the user to fulfill his obligations regarding the use of hazardous products.

