Chemical Safety Data Sheet MSDS / SDS

Decaborane(14) SDS

Revision Date:2024-04-25 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name: Decaborane(14)

CAS: 17702-41-9

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

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SECTION 2: Hazards identification

Classification of the substance or mixture

Flammable solids, Category 1
Acute toxicity - Category 3, Oral

Acute toxicity - Category 3, Dermal
Skin irritation, Category 2
Eye irritation, Category 2
Acute toxicity - Category 2, Inhalation
Specific target organ toxicity – single exposure, Category 3

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H228 Flammable solid
H301 Toxic if swallowed
H311 Toxic in contact with skin
H315 Causes skin irritation
H319 Causes serious eye irritation
H330 Fatal if inhaled
H335 May cause respiratory irritation

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P284 [In case of inadequate ventilation] wear respiratory protection.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

Response

P370+P378 In case of fire: Use ... to extinguish.
P301+P316 IF SWALLOWED: Get emergency medical help immediately.

P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P316 Get emergency medical help immediately.
P361+P364 Take off immediately all contaminated clothing and wash it before reuse.
P332+P317 If skin irritation occurs: Get medical help.
P362+P364 Take off contaminated clothing and wash it before reuse.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P320 Specific treatment is urgent (see ... on this label).
P319 Get medical help if you feel unwell.

Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Decaborane(14)
Common names and synonyms:	Decaborane(14)
CAS number:	17702-41-9
EC number:	241-711-8
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

Following eye contact

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

Following ingestion

Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention .

Most important symptoms/effects, acute and delayed

May cause death or permanent injury after very short exposure to small quantities. Produces marked irritation of skin and mucous membranes. May cause liver injury. (EPA, 1998)

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

Maintain an open airway and assist ventilation if nescessary. treat coma, seizures, hypotension, and renal failure if they occur. There is no specific antidote. Administer activated charcoal (although boric acid is not well absorbed). Consider gastric lavage for large ingestions. Boric acid, Borates, and Boron

SECTION 5: Firefighting measures

Suitable extinguishing media

Smother fire with dry sand or dry clay or spray with water. DO NOT use carbon dioxide or halocarbons. Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

Specific hazards arising from the chemical

Decaborane mixed with carbon tetrachloride is dangerously shock sensitive. It reacts slowly with air but when mixed with air or oxygen, it becomes highly flammable and may explode. It undergoes an explosive reaction with most oxidizing agents including halogenated hydrocarbons. It may give off toxic fumes of unburned material. When heated to decomposition, it emits toxic fumes

of boron oxides. Incompatible with ethers; halocarbons; oxygen at 212F; dimethyl sulfoxide, most oxidizing agents, including halogenated hydrocarbons. It is corrosive to natural rubber, some synthetic rubbers, some greases, and some lubricants. Normally stable, but becomes unstable at elevated temperature and pressure. Hazardous polymerization may not occur. (EPA, 1998)

Special protective actions for fire-fighters

Use special powder, dry sand. NO other agents. In case of fire: keep cylinder cool by spraying with water. NO direct contact with water.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal protection: complete protective clothing including self-contained breathing apparatus. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

Environmental precautions

Personal protection: complete protective clothing including self-contained breathing apparatus. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

1) Ventilate area of spill. 2) For small quantities, sweep onto paper or other suitable material, place in appropriate container and burn in safe place (such as fume hood). Large quantities may be reclaimed ... /if not/ practical, dissolve in flammable solvent (such as alcohol) and atomize in suitable combustion chamber equipped with appropriate effluent gas cleaning device.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames. NO contact with halogenated compounds or oxidizing agents. Above 80°C use a closed system, ventilation and explosion-proof electrical equipment. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Separated from food and feedstuffs, halogens and oxidants. Cool. Dry.Store in a cool, dry, well-ventilated location. Separate from oxidizing materials, halocarbons, and water.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 0.05 ppm as TWA; 0.15 ppm as STEL; (skin).MAK: 0.25 mg/m3, 0.05 ppm; peak limitation category: II(2); skin absorption (H)

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

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

Eye/face protection

Wear face shield.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation (not if powder), local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Decaborane is a white crystals or colorless crystalline needles with an intense, bitter, chocolate-like odor. Used in rocket propellants, as a catalyst in olefin polymerization, as a rubber vulcanizer, to coat metals with corrosion resistant boron, in manufacture of plastics, as an oxygen scavenger; in mothproofing, in dye-stripping, as a reducing and fluxing agent, as a stabilizer and rayon delustrant. (EPA, 1998)
Colour:	White orthorhombic crystals
Odour:	Intense, bitter, chocolate-like odor
Melting point/freezing point:	99-103°C
Boiling point or initial boiling point and boiling range:	213°C
Flammability:	Combustible Solid
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	176° F (EPA, 1998)
Auto-ignition temperature:	300° F (USCG, 1999)
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	Slight (NIOSH, 2016)
Partition coefficient n-octanol/water:	no data available
Vapour pressure:	19 mm Hg at 212° F (EPA, 1998)
Density and/or relative density:	0.94

Relative vapour density:	4.2 (air = 1 at boiling point of decaborane)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

May explode on heating or on contact with flames. Decomposes slowly at 300°C. This produces boron and flammable gas (hydrogen - see ICSC 0001). Decomposes on burning. This produces toxic fumes of boron oxides. Reacts slowly with halogenated materials and ethers. This produces impact-sensitive materials. Reacts explosively with oxidants. Reacts with water and moisture. This produces flammable gas (hydrogen - see ICSC 0001). Attacks natural rubber, some synthetic rubbers, some greases and some lubricants.

Chemical stability

Stable indefinitely at room temperature.

Possibility of hazardous reactions

FlammableDust explosion possible if in powder or granular form, mixed with air.DECABORANE forms impact-sensitive mixtures with halocarbons (carbon tetrachloride) or with ethers (dioxane). It ignites in oxygen at 100° C. When heated to decomposition it emits toxic fumes of boron oxides [Hawthorne, M. F., Inorg. Synth., 1967, 10, p. 93]. It may form an explosive mixture with dimethyl sulfoxide [Shriver, 1969, p. 209]. It reacts with amides, acetone, butyraldehyde, and acetonitrile at room temperature [Merck].

Conditions to avoid

no data available

Incompatible materials

Forms impact-sensitive mixture with ethers (dioxane, etc) and halocarbons (carbon tetrachloride) and ignites in oxygen at 100 deg C.

Hazardous decomposition products

When heated to decomposition, it emits toxic fumes of boron oxides.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat oral 64 mg/kg

Inhalation: LC50 Rat inhalation 46 ppm/4 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

no data available

Reproductive toxicity

no data available

STOT-single exposure

The aerosol is irritating to the eyes, skin and respiratory tract. The substance may cause effects on the central nervous system. This may result in fatigue, hyperexcitability and narcosis. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

The substance may have effects on the central nervous system. This may result in fatigue, inability to concentrate and lack of

coordination.

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

Other adverse effects

no data available

SECTION 13: Disposal considerations

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.

SECTION 14: Transport information

UN Number

ADR/RID: UN1868 (For reference only, please check.)
IMDG: UN1868 (For reference only, please check.)
IATA: UN1868 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: DECABORANE (For reference only, please check.)
IMDG: DECABORANE (For reference only, please check.)
IATA: DECABORANE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 4.1 (For reference only, please check.)
IMDG: 4.1 (For reference only, please check.)
IATA: 4.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: II (For reference only, please check.)
IMDG: II (For reference only, please check.)
IATA: II (For reference only, please check.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

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)

Not Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Not Listed.

IECSC)

Not Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

The onset of symtoms is frequently delayed for 24 to 48 hours after exposure. Explosive limits are unknown in the literature. Reacts violently with fire extinguishing agents such as halons. The odour warning when the exposure limit value is exceeded is insufficient. Do NOT take working clothes home.