

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

| HAZARD RATINGS | HMIS ® | NFPA |
|----------------------|--------|------|
| Health | 3* | 2 |
| Flammability | 1 | 1 |
| Reactivity | 0 | 0 |
| PPE | E | |
| NFPA Special Hazards | | |

| | |
|------------------------------|---|
| Trade Name | PARA-TERT-BUTYLPHENOL (PTBP) |
| NAERG # | 153 |
| WHMIS Classifications | E, D2B |
| CAS Number | 98-54-4 |
| Chemical Name / Class | PARA-TERT-BUTYLPHENOL (CAS # 98-54-4) |
| Product Use | Chemical intermediate |
| TSCA Status | The material, or components, is either on the TSCA inventory list or is exempt from the requirement to be listed. |
| CEPA/DSL Status | on DSL |
| Trade Secret | This information is not considered to represent confidential business information to SI Group |
| Synonym(s): | PTBP |

2. HAZARDS IDENTIFICATION

Emergency Overview

Hazard Statements

ANSI signal word for this material is: DANGER

Per SARA 312 regulations this material represents the following health hazard(s): acute chronic

Per SARA 312 regulations this material is classified as a pure material.

General Fire Hazards

High concentration of airborne dust may form explosive mixture with air. Ensure that good housekeeping practices are followed as well as applicable guidelines such as the National Fire Protection Association [NFPA] 654, "Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids". Vapors may be heavier than air and may travel along the ground to some distant source of ignition and flash back.

Appearance

White to yellow solid.

Emergency overview

Each person who could potentially be exposed to this material, via any route of entry, while performing their assignments, routine and non-routine; from piping; and/or during an emergency situation, should review this MSDS in order to better understand the hazards associated with the material. Accordingly, please note an * in a HMIS® field indicates this material may potentially involve certain chronic health issues such as cancer -- HMIS® is a registered trade and service mark of the NPCA. To work safely with this material : keep away from heat and ignition sources do not get in eyes, on skin or clothing do not breath in material's vapors, dust, or fumes keep container closed use with adequate ventilation -- do not enter any confined spaces without first verifying air quality wash thoroughly after handling

Potential Health Effects

Health Dangers

eye burns skin burns

Health Warnings

lung irritant

Health Cautions

may affect mucous membranes may cause gastrointestinal disturbances may cause leucodermia

Environmental Concerns

PARA-tertiary-BUTYLPHENOL: Aquatic Toxicity: fathead minnow LC50 ~5 mg/l/96h.

3. COMPOSITION / INFORMATION ON INGREDIENTS

| Ingredient Name | CAS Number | Weight Range | Trade Secret | OSHA Hazardous | Capable of Release |
|---------------------------|------------|--------------|--------------------------|-------------------------------------|--------------------------|
| PARA-tertiary-BUTYLPHENOL | 98-54-4 | > 98 % | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

4. FIRST AID MEASURES**Skin contact**

Immediately take off all contaminated clothing. For skin contact, flush with large amounts of water. If any adverse effects persist, get medical attention. The signs and symptoms that may result from an emergency or an unexpected acute overexposure include: rash to irritation to burns

Eye contact

For eye contact, rinse immediately with plenty of water. Seek medical advice. The signs and symptoms that may result from an emergency or an unexpected acute overexposure include: irritation to burns

Inhalation

Move person to non-contaminated air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Seek medical attention. The signs and symptoms that may result from an emergency or an unexpected acute overexposure include: irritation -- respiratory tract

Ingestion

If the material is swallowed, get immediate medical attention or advice. Never give anything by mouth to a victim who is unconscious or is having convulsions. If patient has a good gag reflex, you can consider giving several ounces of water for dilution. The signs and symptoms that may result from an emergency or an unexpected acute overexposure include: nausea ; vomiting ; gastritis

Cardiovascular

The signs and symptoms that may result from an emergency or an unexpected acute overexposure include: arrhythmia

Central Nervous System

Monitor for shock; anticipate seizures and treat accordingly.

5. FIRE FIGHTING MEASURES**Flammable Properties**

| Substance Name | % LEL | % UEL |
|------------------------------|-------|-------|
| PARA-TERT-BUTYLPHENOL (PTBP) | NA | N/A |

Sensitivity to Static Discharge

Material can accumulate static charges from material handling management. Bond and ground as appropriate while recognizing that bonding and grounding alone may be insufficient to eliminate the potential hazard from static-accumulating flammable liquids. For additional recommendations, consult an applicable guideline such as National Fire Protection Association [NFPA] 77, "Recommended Practices on Static Electricity" and API RP "Recommended Practice 2003, Protection Against Ignitions Arising out of Static, Lightning, and Stray Currents" (2008). The Minimum Ignition Energy for some organic solids as a dust may be as low as 3 mJ [millijoules]. The Minimum Explosive Concentration for some organic solids as a dust may be as low as 0.025 oz/ft3 or ~20 g/m3.

Suitable extinguishing media

Dry chemical, foam, carbon dioxide, water fog.

Extinguishing media which must not be used for safety reasons

Do not use a solid water stream as it may scatter and spread fire.

Protection of Firefighters/Specific Hazards Arising from the Chemical

Exclude air; treat like a gasoline or oil fire. Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

6. ACCIDENTAL RELEASE, SPILL, LEAK PROCEDURES

Personal Precautions

Follow facility/company's emergency plans.

Environmental Precautions

Stop the flow of material, if this is without risk. Eliminate sources of ignition. Ventilate the contaminated area. Material will be HOT as a liquid. One may consider allowing the material to cool as part of a response plan. Contain the spill and prevent the material from obtaining access to any confined spaces, public sewers, or waterways.

Methods for Clean-Up

Ventilate the contaminated area. Eliminate ignition sources including sources of electrical, static or frictional sparks. Material will be HOT when in a liquid state. Be sure any absorbents used can withstand the temperature. One may wish to allow it to cool before attempting to collect the material using absorbents, non-sparking tools, explosion-proof vacuums or other equipment required by the size of the release. When material is cool, manage the release as a solid. For example, one can: collect solids, place them into an appropriate container, properly label the container, and then close the container. Immediately arrange for the containers to be placed in an appropriate waste handling area for ultimate transportation or disposal. Thoroughly clean the release area with a suitable agent and collect any cleaning, rinsing media(s) for proper reclamation or disposal. Wear appropriate personal protective equipment during cleanup activities.

Other Information

Wear appropriate protective equipment and clothing during clean-up. Determine appropriate course of action for the collected material. Regulations vary. Consult local authorities before disposal.

Exposure Guidelines

All PPE use is to be determined by a qualified person.

7. HANDLING & STORAGE

Handling

Guard against dust accumulation of this material. As with all chemicals, good industrial hygiene practices should be followed when handling this material. When the container(s) is empty it may retain product residue including vapors which could accumulate. Therefore, do not cut, drill, grind, or weld empty containers. Additionally, do not conduct such activity(ies) near full, partially full, or empty product containers without appropriate workplace safety authorization(s) or permit(s).

Storage

Protect container from physical abuse. Keep the container tightly closed. Store in a cool, dry, well-ventilated storage area. Keep separate from incompatibles. Bond and ground containers when transferring material. Empty product containers may contain product residue. Do not reuse empty containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

All PPE use is to be determined by a qualified person.

Engineering Controls

Ventilation should be sufficient to effectively remove, and prevent buildup of, any vapors, dusts, or fumes that may be generated during handling or thermal processing. In order to ensure appropriate electrical safety practices are followed, consult applicable standards. These may include guidelines such as the National Fire Protection Association [NFPA] 70, "The National Electrical Code" and NFPA 499, "Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas". NOTE: since this material's vapors, dust or fumes can form explosive mixtures in air, ensure that any potential areas where explosions may occur are designed to minimize potential damage. For recommendations to prevent such explosions and associated damage, consult applicable guidelines such as NFPA 69, "Standard on Explosion Prevention Systems" and/or NFPA 68, "Guide for Venting Deflagrations".

Personal Protective Equipment

Eye Protection

Wear safety glasses with side shields; chemical goggles (if splashing is possible). Wear a face shield if a splash hazard exists. Select & use eye protection per a competent health & safety professional using: OSHA [29 CFR 1910.133] or Europe's [EN166].

Skin and body protection

Use appropriate hand protection. Wear impervious gloves for prolonged contact.

Respiratory Protection

Maintain material's vapors, fumes, or particulate levels below any levels of concern including, for solids, considering the material as a particulate not otherwise classified [nuisance dust] @ 10 mg/m3. Select & use respirators per a competent health & safety professional using: OSHA (29 CFR 1910.134); ANSI (Z88.2-1992); or Europe's [EN 149].

9. PHYSICAL & CHEMICAL PROPERTIES

| | | |
|----------------------------|-----------------------------|----------------|
| Physical State | Solid | |
| Melting Point | 98.9 °C (210 °F) | |
| Boiling Point | 236.7 °C (458 °F) | |
| Flash Point | 117.8 °C (244 °F) | Tag Closed Cup |
| Evaporation Rate | <Ether | |
| Flammability Class | Combustible IIIB | |
| Vapor Pressure | 1 mmHg @ 70°C | |
| Vapor Density | 5.1 [Air = 1] | |
| Specific Gravity | 1.037 g/cm3 | |
| Solubility in Water | < 0.5 % | |
| Molecular Weight | 150.24 | |
| Molecular Formula | C10-H14-O | |
| Other Solubility | Soluble in: ethanol; ether. | |

10. STABILITY & REACTIVITY

Stability

Stable under normal conditions [e.g., 70°F (21°C) & 14.7 psig (760 mmHg)].

Conditions to Avoid

Avoid ignition sources where dust is produced.

Incompatible Materials

This material may react with: strong oxidizing agents

Hazardous Decomposition Products

Upon decomposition this product emits carbon monoxide, carbon dioxide, and/or low molecular weight hydrocarbons.

Possibility of Hazardous Reactions

Will not occur under normal conditions [e.g., 70°F (21°C) & 14.7 psig (760 mmHg)].

11. TOXICOLOGICAL INFORMATION

Routes of Entry

eye contact skin contact inhalation ingestion

Target Organs

skin eyes respiratory system

Skin Contact

Dermal LD50s

PARA-tertiary-BUTYLPHENOL 98-54-4 Dermal LD50 [rabbit]: 2520 mg/kg

Skin Irritation

PARA-tertiary-BUTYLPHENOL 98-54-4 Skin, rabbit: 500 mg/24H = mild

Eye Contact

Eye Irritation

PARA-tertiary-BUTYLPHENOL 98-54-4 Eye, rabbit: 10 mg = severe

Ingestion

Oral LD50

PARA-tertiary-BUTYLPHENOL 98-54-4 Oral LD50 [rat]: 5660 mg/kg

12. ECOLOGICAL INFORMATION

Environmental Concerns

PARA-tertiary-BUTYLPHENOL: Aquatic Toxicity: fathead minnow LC50 ~5 mg/l/96h.

Aquatic Toxicity

PARA-tertiary-BUTYLPHENOL: Aquatic Toxicity: fathead minnow LC50 ~5 mg/l/96h.

Persistence / degradability

PARA-tertiary-BUTYLPHENOL: Terrestrial Fate: minimal biodegradation. Aquatic Fate: low biodegradation [BOD3 ~11%].

Mobility

The product is essentially insoluble in water.

13. DISPOSAL CONSIDERATIONS

Disposal Instructions

Manage wastes to satisfy local, state & federal regulations. This material will not be a RCRA hazardous waste if disposed as shipped by SI Group.

14. TRANSPORT INFORMATION

Comments

NOTE: This section's data are provided as a guide to the overall classification of the product. However, transportation classifications may be subject to change as, for example, with changes in package size. Consult shipper requirements under IMO, ICAO (IATA), TDG and 49 CFR to assure regulatory compliance. Additionally, please contact the Transportation & Regulatory Affairs Specialist with SI Group @ (518)-370-4200 if there are questions regarding the cleaning of containers, or vessels. Remember that the reuse, treatment, or disposal, of any related residuals or wastes must be in accordance with all federal, state, and local environmental regulations.

SURFACE TRANSPORTATION (HIGHWAY/RAIL)

BULK-- TANK TRUCK/TANK CAR

| | |
|-----------------------|---|
| Shipping Name | Hot alkylphenols, solid, n.o.s. |
| Hazard Class | 8 |
| Identification Number | UN2430 |
| Packing Group | PG III |
| Marine Pollutant | Marine Pollutant (para-tert-butylphenol) |

DRUM(S)/BAG(S)

| | |
|-----------------------|-----------------------------|
| Shipping Name | Alkylphenols, solid, n.o.s. |
| Hazard Class | 8 |
| Identification Number | UN2430 |
| Packing Group | PG III |

INTERMEDIATE BULK CONTAINER

| | |
|-----------------------|---|
| Shipping Name | Alkylphenols, solid, n.o.s. |
| Hazard Class | 8 |
| Identification Number | UN2430 |
| Packing Group | PG III |
| Marine Pollutant | Marine Pollutant (para-tert-butylphenol) |

PAIL(S)/CAN(S)

| | |
|-----------------------|-----------------------------|
| Shipping Name | Alkylphenols, solid, n.o.s. |
| Hazard Class | 8 |
| Identification Number | UN2430 |
| Packing Group | PG III |

IMDG CODE (WATER)**BULK-- TANK TRUCK/TANK CAR**

Shipping Name HOT ALKYLPHENOLS, SOLID,
N.O.S. (para-tert-butylphenol)

Hazard Class class 8

Identification Number UN2430

Packing Group PG III

Marine Pollutant MARINE POLLUTANT
(para-tert-butylphenol)

DRUM(s)/BAG(s)

Shipping Name ALKYLPHENOLS, SOLID,
N.O.S. (para-tert-butylphenol)

Hazard Class class 8

Identification Number UN2430

Packing Group PG III

Marine Pollutant MARINE POLLUTANT
(para-tert-butylphenol)

INTERMEDIATE BULK CONTAINER

Shipping Name ALKYLPHENOLS, SOLID,
N.O.S. (para-tert-butylphenol)

Hazard Class class 8

Identification Number UN2430

Packing Group PG III

Marine Pollutant MARINE POLLUTANT
(para-tert-butylphenol)

PAIL(s)/CAN(s)

Shipping Name ALKYLPHENOLS, SOLID,
N.O.S. (para-tert-butylphenol)

Hazard Class class 8

Identification Number UN2430

Packing Group PG III

Marine Pollutant MARINE POLLUTANT
(para-tert-butylphenol)

ICAO/IATA (AIR)**PAIL(s)/CAN(s)**

Shipping Name Alkylphenols, solid, n.o.s.

Hazard Class 8

Identification Number UN2430

Packing Group III

15. REGULATORY INFORMATION**U.S. - FDA - Total Food Additives List Sourced from EAFUS**

PARA-tertiary-BUTYLPHENOL 98-54-4 175.300,177.1580,177.1585,177.2410

Superfund Amendments & Reauthorization Act of 1986

This material may be applicable to the SARA regulations. Thus, it may require you to file appropriate governmental reports if the total amount of this material, or any of the listed constituents, in your possession ever exceeds the regulations' threshold values.

State Regulations**U.S. - New Jersey - Right to Know Hazardous Substance List**

PARA-tertiary-BUTYLPHENOL 98-54-4 sn 2101

International Regulations**Canada - WHMIS - Ingredient Disclosure List**

PARA-tertiary-BUTYLPHENOL 98-54-4 1 %

WHMIS Ratings E, D2B

European Classifications

This substance is considered hazardous per The Safety Data Sheets Directive (91/155/EC) as amended

EU Risk Phrases

R36/37/38 Irritating to eyes, respiratory system and skin.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

EU Safety Phrases

S22 Do not breathe dust.
S24 Avoid contact with skin.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S57 Use appropriate container to avoid environmental contamination.
S61 Avoid release to the environment. Refer to special instructions/ Safety data sheets.



16. OTHER INFORMATION

Disclaimer

The health and safety information is that available to SI Group as of the date published and SI Group makes no representation of the information's completeness or accuracy. Any data provided is based on either: reference sources, testing performed on a representative sample(s), or professional judgement. The physical data should not be construed as either representing specifications or a guaranteed analysis. This material has been classified in accordance with the hazard criteria of the Controlled Products Regulation and the MSDS contains information required by Controlled Products Regulation. SI Group provides its MSDS in several languages using English as the primary language. While SI Group uses reasonable efforts to provide accurate translations, SI Group assumes no liability, or responsibility, for errors, omissions or ambiguities in any translations. SI Group expects those persons who receive this MSDS to exercise their independent professional judgement, or consult with a competent health/safety professional, to determine how to utilize this material safely. This includes, but is not exclusive to, the material's appropriateness for a specific use, the type of personal protection equipment necessary, and the use of engineering controls. In no event is SI Group liable for any damages whatsoever arising out of your use of this material based upon information obtained from this MSDS including: direct, indirect, incidental, consequential or punitive claims or damages.