SAFETY DATA SHEET

Revision: C

Revision date: 28/03/2019

Pure Terephthalic Acid

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1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1. Product identifier

Substance name:	**TEREPHTHALIC ACID**
Other means of identification	1,4-Benzenedicarboxylic acid; Benzene-1,4-dicarboxylic acid para-Phthalic acid, TPA, PTA
CAS number	100-21-0
IUPAC name	Terephthalic acid
REACH registration number	01-2119485970-27-0032

1.2. Recommended use of the chemical and restrictions on use

Recommended use	Industrial manufacture of PET (polyester) and other polymers; used to make clothing and plastic bottles.
Restrictions on use	Fireworks applications.

1.3. Details of the supplier of the safety data sheet

Producer	Oriental Petrochemical (Taiwan) Co., Ltd.
Address	No.47 Ching Chien 4th Road, Kuan Yin Industrial Park, Taoyuan Taiwan 32853
Phone no.	+(886)3-272-9588
Emergency phone no.	+(886)3-272-9588

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance

Group A dust. The material can form flammable dust clouds in air.

2.2. Label elements

CAUTION!

2.3. Other hazards

Low systemic toxicity. Practically non-irritant to skin, eyes and respiratory system. Terephthalic acid when dosed to rats at high levels has caused the formation of bladder stones. These have been associated with bladder tumour. This effect is unlikely to occur in humans because the levels used and the route of administration is inappropriate to foreseeable conditions of use.

3. COMPOSITION/INFORMATION ON INGREDIENTS

General information:

Name of the component	Terephthalic acid
Concentration	Pure organic substance >= 99.9 % (w/w)

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Chemical formula	$C_8H_6O_4$
Molecular weight	166.13 [g/mol]
CAS number	100-21-0
IUPAC name	Terephthalic acid
EC number	202-830-0

4. FIRST AID MEASURES

4.1. Description of the first aid measures

Eye	Irrigate with eyewash solution or clean water, holding the eyelids apart, for at least 10 minutes. Obtain medical attention.
Skin	Remove contaminated clothing. Wash skin with water. Obtain medical attention if ill effects occur.
Ingestion	Do not induce vomiting. Wash out mouth with water and give 200-300 ml (half a pint) of water to drink. Obtain medical attention.
Inhalation	Remove patient from exposure. Obtain medical attention if ill effects occur.

4.2. Most important symptoms/effects, acute and delayed

We have no description of any toxic symptoms.

4.3. Indication of immediate medical attention and special treatment needed

Unlikely to be required but if necessary treat symptomatically.

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media	Foam, carbon dioxide, or water fog.
Unsuitable extinguishing media	High pressure water jet.

5.2. Specific hazards arising from the chemical

Hazardous Combustion	The material can form flammable dust clouds in air. Combustion will evolve toxic and irritant vapors.

5.3. Advice for firefighters

Technical actions for protection	Do not try to extinguish the fire without an autonomous respiratory device (SCBA) and protective adapted clothes.
Fire Fighting Protective Equipment	A self-contained breathing apparatus and suitable protective clothing should be worn in fire conditions.

6. ACCIDENTAL RELEASE MEASURES

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6.1. Personal precautions, protective equipment and emergency procedures

Evacuate the danger area to avoid inhalation of dust for non-emergency person.

Wear appropriate personal protective equipment for emergence responders.

6.2. Environmental precautions

In case of accidental release in the environment avoid that the substance can reach drains, surface water and ground water.

6.3. Methods and materials for containment and cleaning up

Clean up spillages. Transfer to a container for disposal or recovery.

Caution - spillages may be slippery.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Avoid contact with eyes. Avoid prolonged skin contact. Control dust formation. Atmospheric levels should be controlled in compliance with the occupational exposure limit.

7.2. Conditions for safe storage, including any incompatibilities.

Keep container closed when not in use and store in a cool, dry, well-ventilated area. Do not expose to high temperatures and heat sources. High voltage static electricity build up is possible when handling, therefore continuous grounding of equipment essential. The atmosphere of any silo or pneumatic transfer equipment where dust explosions could occur should be blanketed with inert gas to below 8% volume oxygen level.

7.3. Specific end use(s):

Chemical intermediate.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Individual protective measures, such as Personal Protective Equipment (PPE)

Eye protection	Suggest safety gloves should be worn.
Hands protection	Suggest gloves should be worn.
Respiratory protection	Wear suitable respiratory protective equipment if exposure to levels above the occupational exposure limit is likely

8.2. Occupational Exposure Limits

OES	LTEL 8hr TWA ppm mg/m³	STEL 15 min. ppm mg/m³	Notes
Terephthalic acid (as total inhalable dust)	10		COM

AEL is OPTC's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:	solid, free-flowing, crystalline powder
Color	white
Odor	almost odorless
pH (Value)	No data available [Note]
Melting point (Deg C)	425 °C in sealed tube
Flash Point (Deg C)	Not applicable
Flammable Limits (Lower) (%v/v)	40
Flammable Limits	No data available
Explosive Properties	Group A dust. The material can form flammable dust clouds in air max. rate of pressure rise: 45500kPa/s max explosion pressure : 790kPa
Oxidising Properties	No data available
Vapour Pressure (Pascal)	$3x10^{-11}$hPa at 20 Deg C
Density (g/ml)	1.5
Solubility (Water)	insoluble (15mg/l at 10 Deg C)
Partition Coefficient	log P n-octanol/water: 1.2 - 2
Flammable Powder Class	A
Minimum Ignition Temperature (Deg C)	500
Minimum Ignition Energy (mJ)	50
Bulk Density (g/ml)	1.12
Sublimation temperature (Deg C)	300

10. STABILITY AND REACTIVITY

10.1. Reactivity

This substance is considered not reactive under the normal conditions of the storage.

10.2. Chemical stability

Stable under room temperatures and pressures.

10.3. Possibility of hazardous reactions

Halogens, strong acids, alkalis, Strong oxidizing agents, potential ignition sources, moisture.

10.4. Conditions to avoid

Heat, sparks, flame and accumulation of static electricity.

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10.5. Incompatible materials

Potential ignition sources, moisture.

10.6. Hazardous decomposition products

Carbon monoxide, Carbon dioxide.

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11. INFORMATION ON TOXICOLOGICAL EFFECTS

Exposure routes	YES	NO
Inhalation	X	
Ingestion	X	
Skin contact	X	
Eye contact	X	

Effects (acute, delayed, chronic) following the exposure (short and/or prolonged):

Ingestion	Low oral toxicity. Oral Median Lethal Dose >6400mg/kg (rat).
Inhalation	High concentrations of dust may be irritant to the upper respiratory tract.
Skin contact	Non-irritant following repeated applications to rat skin. Unlikely to cause skin irritation in man. May cause physical abrasion in contact with skin. Unlikely to be hazardous by skin absorption. Dermal Median Lethal Dose > 2000 mg/kg (rabbit). It is not a skin sensitizer.
Eye contact	Slight/mild irritant to rabbit eyes. May cause physical abrasion in contact with eyes. Permanent damage is unlikely.
Long Term Exposure	Inhalation studies in animals have shown that repeated exposures produce no significant effects.

Terephthalic acid when dosed to rats at high levels has been associated with bladder tumours. No effects were observed below a 1% level in the diet. Further work has demonstrated that the tumours are directly related to bladder stone formation which in turn is caused by the super saturation of the urine of rats fed very high doses of terephthalic acid. This effect is unlikely to occur in humans because the levels used and the route of administration are inappropriate to foreseeable conditions of use. There is no evidence of mutagenic or clastogenic potential.

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity (aquatic and terrestrial, where available).

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STUDY (CAS NO.: 100-21-0)	SPECIES	PROTOCOL	RESULTS
ECOTOXICOLOGICAL DATA (OECD SIDS)			
Acute fish	Salmon gairdneri	OECD 203	96 hour LC50 = 798-1640 mg/l
	Brachydanio rerio	OECD 203	96 hour LC0 = >500 mg/l
	Leuciscus idus	OECD 203	96 hour LC0 = >922 mg/l
Acute daphnia	Daphnia	OECD 202	48 hour EC50 = >982 mg/l
Acute plant	Scenedesmus subspicicatus	OECD 201	96 hour NOEC = >1000 mg/l
Bacteria, etc.	activated sludge	OECD 209	16 day EC50 = 1392.8 mg/l
	Fasciola hepatica		2 hour EC 0 = 830 mg/l
	Tetrahymena		24 hour EC50 = 800 mg/l
	pyriformis		
	Caenorhabditis		EC0 = 1 µg/ml
	Elegans		
Terrestrial plants	Avena sativa		24 hour EC0 = 100 mg/l
	Oryza sativa		5 day EC 20 = 100 mg/l
Non-mammalian species	Drosophila melanogaster		3 day LC 0 = 166 mg/kg

12.2. Persistence and degradability.

The substance is substantially biodegradable. There is evidence of rapid degradation in water. Ready Biodegradation: > 70%. Inherent Biodegradation: >90%.

12.3. Bio-accumulative potential.

Solid has low volatility. The substance is essentially insoluble in water. The substance has low potential for bioaccumulation.

12.4. Mobility in soil.

No information available.

12.5. Other adverse effects.

No information available.

13. DISPOSAL CONSIDERATION

Bury on an authorized landfill site or incinerate under approved controlled conditions. Disposal should be in accordance with local, state or national legislation.

14. TRANSPORT INFORMATION

Not Classified as Dangerous for Transport.

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UK TANKER LABELLING - NON-HAZARDOUS CHEMICAL(S)

Emergency Action Code	2{Z}
Warning Phrase	NONE

15. REGULATORY INFORMATION

Not Classified as Dangerous for Supply/Use.

Not Classified as Dangerous for the Environment (Aquatic).

16. OTHER INFORMATION

Note:

Dust hazard classification test : Provides dust testing for the qualitative assessment of the explosibility of the dust. Group A : Combustible dusts which ignite and propagate flame (explosible).

This data sheet was prepared in accordance with Directive 93/112/EC.Use : raw material

The following sections contain revisions or new statements: 2, 7, 8,

The oxygen level has been reduced from 10 to 8% volume in section 7

PTA is insolvable in water under normal temperature and pressure (NTP). PTA mix with water (pH 7) under NTP, and then test pH of water near 4 to 5.

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