



TCI AMERICA

SAFETY DATA SHEET

Revision number: 2
Revision date: 10/06/2014

1. IDENTIFICATION

Product name: Dibutyl Phosphate
Product code: P0260

Product use: For laboratory research purposes.
Restrictions on use: Not for drug or household use.

Company:
TCI America
9211 N. Harborside Street
Portland, OR 97203 U.S.A.
Telephone:
+1-800-423-8616 / +1-503-283-1681
Fax:
+1-888-520-1075 / +1-503-283-1987
e-mail:
sales-US@TCIchemicals.com
www.TCIchemicals.com

Emergency telephone number:
Chemical Emergencies:
TCI America (8:00am - 5:00pm) PST
+1-503-286-7624
Transportation Emergencies:
Chemtrec 24-Hour
+1-800-424-9300 (U.S.A.)
+1-703-527-3887 (International)
Responsible department:
TCI America
Environmental Health Safety and Security
+1- 503-286-7624

2. HAZARD(S) IDENTIFICATION

OSHA Haz Com: CFR 1910.1200:
Eye Damage/Irritation [Category 1]
Specific Target Organ Toxicity (Single Exposure) [Category 3]
Specific Target Organ Toxicity (Repeated Exposure) [Category 2]
Corrosive to Metals [Category 1]
Skin Corrosion/Irritation [Category 1C]

Signal word: Danger!

Hazard Statement(s):
Causes serious eye damage
Causes severe skin burns and eye damage
May be corrosive to metals
May cause respiratory irritation. May cause drowsiness or dizziness.
May cause damage to organs: Liver Adrenal Gland Urinary Bladder through prolonged or repeated exposure.

Pictogram(s) or Symbol(s):



Precautionary Statement(s):
[Prevention]

Do not breathe dusts or mists. Use only outdoors or in a well-ventilated area. Wear protective gloves, protective clothing, eye protection and face protection. Wear eye protection. Wear face protection (full length face shield). Avoid breathing fume, mist, vapors or spray. Do not breathe fume, mist, vapors or spray. Keep only in original container.

[Response]

If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center or doctor. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center or doctor if you feel unwell. Get medical advice or attention if you feel unwell. Absorb spillage to prevent material damage.

[Storage]

Store locked up. Store in a well-ventilated place. Keep container tightly closed. Store in corrosive resistant container with a resistant inner liner.

[Disposal]

Dispose of contents and container in accordance with US EPA guidelines for the classification and determination of hazardous waste listed in 40 CFR 261.3. (See Section 13)

Hazards not otherwise classified: [HNOC] May be harmful if swallowed.

2. HAZARD(S) IDENTIFICATION**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance/Mixture:	Substance
Components:	Dibutyl Phosphate
Percent:	>97.0%(T)
CAS Number:	107-66-4
Molecular Weight:	210.21
Chemical Formula:	C ₈ H ₁₉ O ₄ P
Synonyms:	Phosphoric Acid Dibutyl Ester

4. FIRST-AID MEASURES

Inhalation:	Immediately call a poison center or doctor. Effects of exposure (inhalation) to substance may be delayed. Inhalation of vapors or contact with substance will result in contamination and potential harmful effects. Move victim to fresh air. Give artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
Skin contact:	For severe burns, immediate medical attention is required. Immediately call a poison center or doctor. Effects of exposure (skin contact) to substance may be delayed. Remove and wash contaminated clothing before re-use. In case of contact with substance, immediately flush skin with running water for at least 20 minutes. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
Eye contact:	IMMEDIATELY flush eyes with running water for at least 15 minutes, keeping eyelids open. Eye contact with vapors or substance may cause severe injury, burns, or death. Call emergency medical service. Move victim to fresh air. Check for and remove any contact lenses. Keep victim warm and quiet. Treat symptomatically and supportively. Effects of exposure to substance may be delayed. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
Ingestion:	Do not induce vomiting without medical advice. Effects of exposure (ingestion) to substance may be delayed. Call a physician or Poison Control Center immediately. Do not use mouth-to-mouth method if victim ingested the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Loosen tight clothing such as a collar, tie, belt or waistband. If a person vomits place them in the recovery position so that vomit will not reenter the mouth and throat. Rinse mouth. Keep victim warm and quiet. Treat symptomatically and supportively. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
Symptoms/effects:	
Acute:	Dizziness. Pain. Redness. Drowsiness.
Delayed:	May have effects on the respiratory tract.
Immediate medical attention:	WARNING: It might be hazardous to the person providing aid to give mouth-to-mouth respiration, because the inhaled material is corrosive. For severe burns, immediate medical attention is required. If breathing has stopped, perform artificial respiration. Use first aid treatment according to the nature of the injury. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media:	Dry chemical, CO ₂ or water spray. Consult with local fire authorities before attempting large scale fire fighting operations.
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Specific hazards arising from the chemical

Hazardous combustion products:	These products include: Carbon oxides Phosphates
Other specific hazards:	Closed containers may explode from heat of a fire.

Special precautions for fire-fighters:

Use water spray or fog; do not use straight streams. Dike fire-control water for later disposal; do not scatter the material. Containers may explode when heated. Move containers from fire area if you can do it without risk.

Special protective equipment for fire-fighters:

Wear positive pressure self-contained breathing apparatus (SCBA). Structural fire fighters' protective clothing provides limited protection in fire situations ONLY; it may not be effective in spill situations. Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Avoid contact with skin, eyes, and clothing. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (Section 8). Warn unnecessary personnel to move away. Stop leak if you can do it without risk. Ensure adequate ventilation. Isolate the hazard area and deny entry to unnecessary and unprotected personnel.
Personal protective equipment:	Wear eye protection (splash goggles) and face protection (full length face shield). Lab coat. Vapor respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear protective gloves (nitrile).
Emergency procedures:	Do not clean-up or dispose except under supervision of a specialist. In case of a spill and/or a leak, always shut off any sources of ignition, ventilate the area, and exercise caution. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Warn personnel to move away. Prevent entry into sewers, basements or confined areas; dike if needed.

Methods and materials for containment and cleaning up:

ELIMINATE all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop leak if without risk. Absorb with an inert material and put the spilled material in an appropriate waste disposal container. Use clean non-sparking tools to collect absorbed material. Ventilate the area.

Environmental precautions:

Keep away from living quarters. Prevent further leakage or spillage if safe to do so. Water runoff can cause environmental damage. Prevent entry into sewers, basements or confined areas; dike if needed.

7. HANDLING AND STORAGE

Precautions for safe handling:	Do NOT breathe gas, fumes, vapor, or spray. Manipulate under an adequate fume hood. Avoid contact with skin and eyes. May corrode metallic surfaces. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Keep container dry. Handle and open container with care. Wear suitable protective clothing, gloves and eye/face protection. When using do not eat, drink, or smoke. Keep away from sources of ignition.
Conditions for safe storage:	Store locked up. Keep containers tightly closed in a cool, well-ventilated place. Store in corrosive resistant container with a resistant inner liner. Keep away from incompatibles. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Avoid prolonged storage periods. Store under inert gas (e.g. Argon).
Storage incompatibilities:	Bases, Combustible substances, Store away from oxidizing agents

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Exposure limits:**

ACGIH TLV (TWA): 5 mg/m³ (IFV) (skin)

Appropriate engineering controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Ventilation is normally required when handling or using this product. Eyewash fountains should be provided in areas where there is any possibility that workers could be exposed to the substance. Follow safe industrial engineering/laboratory practices when handling any chemical.

Personal protective equipment

Respiratory protection:	Vapor respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent.
Hand protection:	Wear protective gloves.
Eye protection:	Splash goggles.
Skin and body protection:	Lab coat.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state (20°C):	Liquid
Form:	Clear
Color:	Colorless - Pale yellow
Odor:	Odorless
Odor threshold:	No data available

Melting point/freezing point:	-13°C (9°F)
Boiling point/range:	138°C (280°F)
Decomposition temperature:	No data available
Relative density:	1.06
Kinematic Viscosity:	No data available

Partition coefficient: 0.6 - 1.4
n-octanol/water (log P_{ow})

pH:	No data available
Vapor pressure:	0.13kPa/20°C
Vapor density:	7.2
Dynamic Viscosity:	No data available

Evaporation rate: No data available
(Butyl Acetate = 1)

9. PHYSICAL AND CHEMICAL PROPERTIES

Flash point:	196°C (385°F)	Autoignition temperature:	420°C (788°F)
Flammability (solid, gas):	No data available	Flammability or explosive limits:	
		Lower:	No data available
		Upper:	No data available

Solubility(ies):**Water:** Slightly soluble (1.8g/100mL, 20°C)**Soluble:** Carbon tetrachloride, Butanol, Many organic solvents**10. STABILITY AND REACTIVITY**

Reactivity:	Corrodes in contact with metals.
Chemical Stability:	Air sensitive.
Possibility of Hazardous Reactions:	No hazardous reactivity has been reported.
Conditions to avoid:	Air sensitive. Exposure to air.
Incompatible materials:	Oxidizing agents
Hazardous Decomposition Products:	No data available

11. TOXICOLOGICAL INFORMATION**RTECS Number:** TB9605000**Acute Toxicity:**

orl-rat LD50:3200 mg/kg

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

IARC: No data available**NTP:** No data available**OSHA:** No data available**Reproductive toxicity:**

No data available

Toxic Effects:

Maternal effects - other effects.

Effects on newborn - live birth index.

Effects on newborn - viability index.

Routes of Exposure:

Inhalation, Eye contact, Ingestion, Skin contact.

Symptoms related to exposure:

Skin contact may produce burns. Skin contact may result in inflammation; characterized by itching, scaling, reddening, or occasionally blistering. Eye contact can result in corneal damage or blindness. Inhalation causes irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Potential Health Effects:

Inhalation causes irritation of the lungs and respiratory system. May be harmful if inhaled or ingested. Overexposure may result in serious illness or death.

Target organ(s):

May cause respiratory irritation. May cause drowsiness or dizziness.

May cause damage to organs: Liver Adrenal Gland Urinary Bladder through prolonged or repeated exposure.

12. ECOLOGICAL INFORMATION**Ecotoxicity****Fish:** 48h LC50:>250 mg/L (Oryzias latipes)**Crustacea:** No data available

12. ECOLOGICAL INFORMATION

Algae:	No data available
Persistence and degradability:	2 % (by BOD), 3 % (by TOC), 5 % (by GC)
Bioaccumulative potential (BCF):	<0.7 (conc. 2 mg/L), <6.9 (conc. 0.2 mg/L)
Mobility in soil:	No data available
Partition coefficient:	0.6 - 1.4
n-octanol/water (log P_{ow})	
Soil adsorption (K_{oc}):	419
Henry's Law:	4.3 x 10 ⁻⁴
constant (PaM³/mol)	

Other adverse effects:

Environmental Fate/Exposure Summary: Dibutyl phosphate's production and use as a catalyst, an antifoaming agent, and in metal separation and extraction may result in its release to the environment through various waste streams. If released to air, an estimated vapor pressure of 3.8X10⁻⁵ mm Hg at 25 deg C indicates dibutyl phosphate will exist in both the vapor and particulate phases in the atmosphere. Vapor-phase dibutyl phosphate will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 7.3 hours. Particulate-phase dibutyl phosphate will be removed from the atmosphere by wet or dry deposition. Dibutyl phosphate does not contain chromophores that absorb at wavelengths >290 nm and therefore is not expected to be susceptible to direct photolysis by sunlight. If released to soil, dibutyl phosphate is expected to have moderate mobility based upon an estimated K_{oc} of 490. Volatilization from moist soil surfaces is not expected to be an important fate process based upon an estimated Henry's Law constant of 4.3X10⁻⁹ atm-cu m/mole. The estimated pK_a of dibutyl phosphate is 0.88, indicating that this compound will primarily exist in anion form in the environment and anions generally do not adsorb more strongly to organic carbon than their neutral counterparts. The sorption of organophosphorus compounds in soil depends on both organic matter and clay content of soil and the sorption increases as the pH of soil decreases. Dibutyl phosphate is not expected to volatilize from dry soil surfaces based upon its vapor pressure. If released into water, dibutyl phosphate is expected to adsorb to suspended solids and sediment based upon the estimated K_{oc}. Dibutyl phosphate, present at 4.4 mg/l, reached 12% of its theoretical oxygen demand in 28 days using a municipal sludge inoculum in a closed bottle test. Volatilization from water surfaces is not expected to be an important fate process based upon this compound's estimated Henry's Law constant. An estimated pK_a of 0.88 indicates that dibutyl phosphate will exist almost entirely in the anion form at pH values of 5 to 9. An estimated BCF of 66 suggests the potential for bioconcentration in aquatic organisms is moderate. Hydrolysis is expected to be an important environmental fate process since this compound contains functional groups that hydrolyze under environmental conditions. The hydrolysis half-life of the analog dimethyl phosphoric acid in neutral solution at 100 deg C was found to be 2.4 days. Increasing the carbon chain substituent on phosphoric acid (as in the case of dibutyl phosphate) may not increase the rate of hydrolysis. Occupational exposure to dibutyl phosphate may occur through the respiratory tract and dermal contact with this compound at workplaces where dibutyl phosphate is produced or used.

13. DISPOSAL CONSIDERATIONS

Disposal of product:	Recycle to process if possible. It is the generator's responsibility to comply with Federal, State and Local rules and regulations. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. This section is intended to provide assistance but does not replace these laws, nor does compliance in accordance with this section ensure regulatory compliance according to the law. US EPA guidelines for Identification and Listing of Hazardous Waste are listed in 40 CFR Parts 261. The product should not be allowed to enter the environment, drains, water ways, or the soil.
Disposal of container:	Dispose of as unused product. Do not re-use empty containers.
Other considerations:	Observe all federal, state and local regulations when disposing of the substance.

14. TRANSPORT INFORMATION**DOT (US)**

UN number:	Proper Shipping Name:	Class or Division:	Packing Group:
UN1718	Butyl acid phosphate	8 Corrosive material	III

IATA

UN number:	Proper Shipping Name:	Class or Division:	Packing Group:
UN1718	Butyl acid phosphate	8 Corrosive material	III

IMDG

UN number:	Proper Shipping Name:	Class or Division:	Packing Group:
UN1718	Butyl acid phosphate	8 Corrosive material	III

EmS number: F-A, S-B

15. REGULATORY INFORMATION**Toxic Substance Control Act (TSCA 8b.):**

This product is ON the EPA Toxic Substances Control Act (TSCA) inventory.

US Federal Regulations**CERCLA Hazardous substance and Reportable Quantity:**

SARA 313: Not Listed

15. REGULATORY INFORMATION

SARA 302: Not Listed

State Regulations**State Right-to-Know**

Massachusetts Not Listed

New Jersey Listed

Pennsylvania Not Listed

California Proposition 65: Not Listed

Other Information**NFPA Rating:**

Health: 2

Flammability: 1

Instability: 0

HMIS Classification:

Health: 2

Flammability: 1

Physical: 0

International Inventories

WHMIS hazard class: E: Corrosive material.

Canada: DSL On DSL

EC-No: 203-509-8

16. OTHER INFORMATION

Revision date: 10/06/2014

Revision number: 2

TCI chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its affiliates or subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our SDS are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated SDS for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, face mask, fume hood). For proper handling and disposal, always comply with federal, state and local regulations.