ionz

SAFETY DATA SHEET

Updated on 26/09/2024

1. Material Identification

Product Name : Dibutyl phthalate
Catalog Number : io-2133
CAS Number : 84-74-2
Identified uses : Laboratory chemicals, manufacture of chemical compounds
Company : Ionz

>> R&D Use only

2. Hazards Identification

GHS Classification:

Flammable liquid (category 2)
Acute toxicity, oral (Category 3)
Acute toxicity, dermal (Category 3)
Acute toxicity, inhalation (Category 3)
Specific target organ toxicity, single exposure (Category 1)

Note

>> Pictograms displayed are for > 99.9% (1307 of 1308) of reports that indicate hazard statements. This chemical does not meet GHS hazard criteria for < 0.1% (1 of 1308) of reports.

Pictogram(s)

GHS Hazard Statements

>> H360 (> 99.9%): May damage fertility or the unborn child [Danger Reproductive toxicity]

>> H400 (> 99.9%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

Precautionary Statement Codes

>> P203, P273, P280, P318, P391, P405, and P501

NFPA 704 Diamond

NFPA Health Rating

>> 2 - Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

NFPA Fire Rating

>> 1 - Materials that must be preheated before ignition can occur. Materials require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur.

NFPA Instability Rating

>> 0 - Materials that in themselves are normally stable, even under fire conditions.

Health Hazards:

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> Inhalation of material may be harmful. Contact may cause burns to skin and eyes. Inhalation of Asbestos dust may have a damaging effect on the lungs. Fire may produce irritating, corrosive and/or toxic gases. Some liquids produce vapors that may cause dizziness or asphyxiation. Runoff from fire control or dilution water may cause environmental contamination. (ERG, 2024)

>> Combustible. (USCG, 1999)

>> Combustible.

3. Composition/Information On Ingredients

Chemical name : Dibutyl phthalate
CAS Number : 84-74-2
Molecular Formula : C16H22O4
Molecular Weight : 278.3400 g/mol

4. First Aid Measures

First Aid:

>> EYES: First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. IMMEDIATELY transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

>> SKIN: IMMEDIATELY flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. If symptoms such as redness or irritation develop, IMMEDIATELY call a physician and be prepared to transport the victim to a hospital for treatment.

>> INHALATION: IMMEDIATELY leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

>> INGESTION: DO NOT INDUCE VOMITING. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and IMMEDIATELY call a hospital or poison control center. Be prepared to transport the victim to a hospital if advised by a physician. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. DO NOT INDUCE VOMITING. IMMEDIATELY transport the victim to a hospital. (NTP, 1992)

First Aid Measures

Inhalation First Aid

>> Fresh air, rest.

Skin First Aid

>> Remove contaminated clothes. Rinse skin with plenty of water or shower.

Eye First Aid

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

Ingestion First Aid

>> Rinse mouth. Refer for medical attention .

5. Fire Fighting Measures

>> Aerosols from heated dibutyl phthalate may cause irritation of the eyes and upper-respiratory tract.

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> CAUTION: Fire involving Safety devices (UN3268) and Fire suppressant dispersing devices (UN3559) may have a delayed activation and a risk of hazardous projectiles. Extinguish the fire at a safe distance.

>> SMALL FIRE: Dry chemical, CO2, water spray or regular foam.

>> LARGE FIRE: Water spray, fog or regular foam. Do not scatter spilled material with high-pressure water streams. If it can be done safely, move undamaged containers away from the area around the fire. Dike runoff from fire control for later disposal.

>> FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks in direct contact with flames. (ERG, 2024)

>> Use foam, dry powder, carbon dioxide.

6. Accidental Release Measures

Isolation and Evacuation:

Isolation and evacuation measures to take when a large amount of this chemical is accidentally released in an emergency.

>> Excerpt from ERG Guide 171 [Substances (Low to Moderate Hazard)]:

>> IMMEDIATE PRECAUTIONARY MEASURE: Isolate spill or leak area in all directions for at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids.

>> SPILL: Increase the immediate precautionary measure distance, in the downwind direction, as necessary.

>> FIRE: If tank, rail tank car or highway tank is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions. (ERG, 2024)

Spillage Disposal:

Methods for containment and safety measures to protect workers dealing with a spillage of this chemical.

>> Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in vermiculite, sand or inert absorbent. Then store and dispose of according to local regulations.

7. Handling And Storage

Safe Storage:

>> Separated from strong oxidants.

Storage Conditions:

>> Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

8. Exposure Control/ Personal Protection

REL-TWA (Time Weighted Average)

>> 5 mg/m³

>> TWA 5 mg/m3

>> 5.0 [mg/m3]

PEL-TWA (8-Hour Time Weighted Average)

>> 5 mg/m³

>> 5.0 [mg/m3]

>> 5 mg/m

TLV-TWA (Time Weighted Average)

>> 5 mg/m³ [1990]

MAK (Maximale Arbeitsplatz Konzentration)

>> 0.58 mg/m

Inhalation Risk:

>> A harmful contamination of the air will not or will only very slowly be reached on evaporation of this substance at 20 °C.

Effects of Long Term Exposure:

>> Animal tests show that this substance possibly causes toxicity to human reproduction or development.

Fire Prevention

>> NO open flames.

Exposure Prevention

>> PREVENT GENERATION OF MISTS! AVOID EXPOSURE OF (PREGNANT) WOMEN!

Inhalation Prevention

>> Use ventilation.

Skin Prevention

>> Protective gloves.

Eye Prevention

>> Wear safety goggles.

Ingestion Prevention

>> Do not eat, drink, or smoke during work.

Exposure Control and Personal Protection

Maximum Allowable Concentration (MAK)

>> 0.58 [mg/m3] (can also occur as vapor and aerosol)[German Research Foundation (DFG)]

9. Physical And Chemical Properties

Molecular Weight:

>> 278.34

Exact Mass:

>> 278.15180918

Physical Description:

>> N-butyl phthalate is a colorless oily liquid. It is insoluble in water. The primary hazard is the threat to the environment. Immediate steps should be taken to limit its spread to the environment. Since it is a liquid it can easily penetrate the soil and contaminate groundwater and nearby streams. It is combustible though it may take some effort to ignite. It is used in paints and plastics and as a reaction media for chemical reactions.

>> COLOURLESS-TO-YELLOW VISCOUS LIQUID WITH CHARACTERISTIC ODOUR.

Color/Form:

>> Colorless to faint yellow, oily liquid

Odor:

>> Slight, aromatic odor

Taste:

The sensation of flavor perceived in the mouth and throat on contact with a substance.

>> Tastes strong and bitter

Boiling Point:

>> 644 °F at 760 mmHg (NTP, 1992)

>> 340 °C

Melting Point:

>> -31 °F (NTP, 1992)

>> -35 °C

Flash Point:

>> 315 °F (NTP, 1992)

>> 157 °C c.c.

Solubility:

>> less than 1 mg/mL at 68 °F (NTP, 1992)

>> Solubility in water, g/100ml at 25 °C: 0.001

Density:

>> 1.049 at 68 °F (USCG, 1999) - Denser than water; will sink

>> Relative density (water = 1): 1.05

Vapor Density:

>> 9.58 (NTP, 1992) - Heavier than air; will sink (Relative to Air)

>> Relative vapor density (air = 1): 9.58

Vapor Pressure:

>> 1 mmHg at 297 °F ; 1.1 mmHg at 302 °F (NTP, 1992)

>> Vapor pressure, kPa at 20 °C:

LogP:

>> log Kow = 4.50

>> 4.72

Stability/Shelf Life:

>> Stable under recommended storage conditions.

Autoignition Temperature:

>> 757 °F (USCG, 1999)

>> 402 °C

Decomposition:

>> When heated to decomp it emits acrid smoke and fumes.

Viscosity:

>> 0.203 poise at 20 °C

Heat of Combustion:

>> -13,300 BTU/lb = -7400 cal/g = -310X10+5 J/kg

Heat of Vaporization:

>> 79.2 kJ/mol at 340 °C

Surface Tension:

>> Liquid surface tension: 34 dynes/cm = 0.034 N/M at 20 °C

Odor Threshold:

>> In humans, an olfactory threshold value ranging from 0.26 to 1.47 mg/cu m /was found/.

Refractive Index:

>> Index of refraction: 1.4900 at 20 °C/D

Collision Cross Section:

Collision cross section (CCS) represents the effective area for the interaction between an individual ion and the neutral gas through which it is traveling (e.g., in ion mobility spectrometry (IMS) experiments). It quantifies the probability of a collision taking place between two or more particles.

>> 180.7 Å² [M+Na]+ [CCS Type: TW; Method: calibrated with polyalanine and drug standards]

10. Stability And Reactivity

>> Insoluble in water.

11. Toxicological Information

Toxicity Summary:

>> IDENTIFICATION AND USE: Dibutyl phthalate (DBP) is a colorless to faint yellow, oily liquid. It is used as plasticizer; solvent for oil-soluble dyes, insecticides and other organics; antifoam agent; textile fiber lubricant; fragrance fixative; insect repellent. HUMAN EXPOSURE AND TOXICITY: DBP appears to have little potential to irritate skin or eyes or to induce sensitization. In humans, a few cases of sensitization after exposure to DBP have been reported. In vitro studies showed human skin has been found to be less permeable than rat skin to this compound. A case described in which a chemical worker accidentally swallowed about 10 g of DBP. Delayed signs and symptoms included nausea, vomiting, and dizziness, followed later by headache, pain, and irritation in the eyes, lacrimation, photophobia, and conjunctivitis. Complete recovery occurred within 2 wk. There was evidence of a slight effect on the kidney, which may have been the result of systemic hydrolysis of the ester and cumulative effects of the alcohol and the acid, as well as their oxidation and decomposition products. A recent report described increases in the incidences of hypospadias ($p<0.05$), cryptorchidism ($p<0.05$) and breast cancer ($p<0.05$) in the children of New Zealand soldiers who served in Malaya (1948-1960) and were exposed to DBP applied daily to their clothing as an acaricide to prevent tick-transmitted bush typhus. In other study high exposure to DBP was associated with earlier age at pubarche in boys. DBP exposure in human leukocyte cultures did not result in chromatid aberrations. DBP induced proliferation in estrogen-responsive breast cancer cell lines MCF-7 and ZR-75. ANIMAL STUDIES: The profile of effects following exposure to DBP is similar to that of other phthalate esters, which, in susceptible species, can induce hepatomegaly, increased numbers of hepatic peroxisomes, fetotoxicity, teratogenicity, and testicular damage. The acute toxicity of DBP in rats and mice is low. Signs of acute toxicity in laboratory animals include depression of activity, labored breathing, and lack of coordination. In short-term repeated-dose toxicity studies, effects in rats after oral administration included peroxisome proliferation and hepatomegaly. In longer-term studies, the effects in rats included reduced rate of weight gain, increase in relative liver weight, peroxisomal proliferation with increased peroxisomal enzyme activity, as well as alteration in testicular enzymes and degeneration of testicular germinal cells of rats. There are considerable species differences in effects on the testes following exposure to DBP, minimal effects being observed in mice and hamsters. In a continuous breeding protocol results suggest that the adverse effects of DBP are more marked in animals exposed during development and maturation than in animals exposed as adults only. DBP generally induces fetotoxic effects in the absence of maternal toxicity. Available data also indicate that DBP is teratogenic at high doses and that susceptibility to teratogenesis varies with developmental state and period of administration. DBP is not genotoxic. Since DBP causes peroxisomal proliferation, it is possible that it might be a rodent liver carcinogen, although it is much weaker in inducing hepatomegaly and peroxisome proliferation than diethylhexyl phthalate. In rats, following ingestion, DBP is metabolized by nonspecific esterases mainly in the small intestine to yield mono-n-butyl phthalate with limited subsequent biochemical oxidation of the alkyl side chain. Mono-n-butyl phthalate is stable and resistant to hydrolysis of the second ester group. Mono-n-butyl phthalate and other metabolites are excreted in the urine mainly as glucuronide conjugates. ECOTOXICITY STUDIES: The risk to aquatic organisms associated with the present mean concentrations of DBP in surface water is low. However, in highly polluted rivers the safety margin is much smaller. Recent data show that a continuous exposure to subacute concentrations of DBP for 7 d can cause antiestrogenicity in female adult Murray rainbowfish. For DBP fed ring dove (Streptophelia risoria) eggs were examined in a 3-week experiment. Egg shell thickness was found to be decreased (10%), whereas the water permeability increased (23%). Vapor of dibutyl phthalate in light produces disturbances in carotenoid synthesis of green plants resulting in chlorophyll deficiency and in extreme cases completely chlorophyll-free leaves having a white color.

USGS Health-Based Screening Levels for Evaluating Water-Quality:

This section provides the USGS Health-Based Screening Levels for Evaluating Water-Quality data.

Chemical

>> Di-n-butyl phthalate

Noncancer HBSL (Health-Based Screening Level)[μg/L]

>> 600

Reference

>> Smith, C.D. and Nowell, L.H., 2024. Health-Based Screening Levels for evaluating water-quality data (3rd ed.). DOI:10.5066/F71C1TWP

Evidence for Carcinogenicity:

Evidence that this chemical does or may cause cancer. The information here is collected from various sources by the Hazardous Substances Data Bank (HSDB).

>> Cancer Classification: Group D Not Classifiable as to Human Carcinogenicity

Carcinogen Classification:

This section provides the International Agency for Research on Cancer (IARC) Carcinogenic Classification and related monograph links. In the IARC Carcinogenic classification, chemicals are categorized into four groups: Group 1 (carcinogenic to humans), Group 2A (probably carcinogenic to humans), Group 2B (possibly carcinogenic to humans), and Group 3 (not classifiable as to its carcinogenicity to humans).

>> No indication of carcinogenicity to humans (not listed by IARC).

Health Effects:

>> Adverse effects from di-n-butyl phthalate exposure have not yet been reported in humans. However, animals studies have shown that di-n-butyl phthalate can affect reproductive ability by decreasing sperm count and causing birth defects. (L133)

Exposure Routes:

>> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

>> inhalation, ingestion, skin and/or eye contact

Eye Exposure

>> Redness. Pain.

Ingestion Exposure

>> Abdominal pain. Diarrhoea. Nausea. Vomiting.

>> irritation eyes, upper respiratory system, stomach

Target Organs:

Organs that are affected by exposure to this chemical. Information in this section reflects human data unless otherwise noted.

>> Developmental (effects during periods when organs are developing) , Reproductive (Producing Children)

Adverse Effects:

An adverse effect is an undesired harmful effect resulting from a medical treatment or other intervention.

>> Reproductive Toxin - A chemical that is toxic to the reproductive system, including defects in the progeny and injury to male or female reproductive function. Reproductive toxicity includes developmental effects. See Guidelines for Reproductive Toxicity Risk Assessment.

>> Skin Sensitizer - An agent that can induce an allergic reaction in the skin.

Toxicity Data:

>> LC50 (mice) = 25,000 mg/m3/2H

Interactions:

>> An antagonistic interaction was observed in houseflies upon simultaneous application of di-2-ethylhexyl phthalate or dibutyl phthalate with 21 organophosphates.

Antidote and Emergency Treatment:

>> Remove to fresh air. Wash affected skin areas with water. Flush eyes with water.

Human Toxicity Excerpts:

>> /HUMAN EXPOSURE STUDIES/ In humans, an olfactory threshold value ranging from 0.26 to 1.47 mg/cu m /was determined/. Atmospheric concentrations of 0.12 and 0.15 mg/cu m resulted in abnormal encephalographic responses in

the three human subjects in the study. When the level was reduced to 0.093 mg/cu m no conditioned reflex was noted. A PSC value of 0.1 mg/cu m is recommended.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ /In white rats, ages 5 to 6 wk and weighing 60-75 g acute toxicity: the two modes of administration chosen were oral and im. The first gave a rather high lethal dose LD50, 8-10 g/kg body weight (at 4 g/kg, all the animals remained alive, at 8 g/kg 4 out of 9 died, and at 16 g/kg 6 out of 6 died). The fatal im dose was even higher, since doses of 8 g/kg body weight did not bring about the death of a single animal.

Non-Human Toxicity Values:

>> LD50 Rat ip 3050 mg/kg

National Toxicology Program Studies:

Reports from the National Toxicology Program, an interagency program supported by three government agencies (NIH, FDA, and CDC) within the Department of Health and Human Services. This program plays a critical role in generating, interpreting, and sharing toxicological information about chemicals of public health concerns.

>> Di(n-butyl) phthalate (DBP) was evaluated using the "Reproductive Assessment by Continuous Breeding" protocol & Swiss CD-1 mice. In the present study ... dietary levels of 0.0, 0.03, 0.3 & 1.0% DBP (> or =99% pure) were employed in Task 2. Continuous exposure of CD-1 mice (11 wks of age at outset) to the 1.0% dietary level of DBP significantly diminished (p< 0.01) the number of breeding pairs able to produce at least one litter as compared to the control pairs. In contrast, the 0.03 & 0.3% dietary levels of DBP had no effect on the fertility of breeding pairs. DBP at the highest dietary level (1.0%) also significantly decreased the number of litters delivered/pair, the average litter size, & the proportion of pups born alive as compared to the control & two lower dose groups. In addition, the proportion of live males/litter (males/total) was significantly greater in the 1.0% DBP group versus the control, & the 0.03 & 0.3% DBP groups, implying that male fetuses may be slightly more resistant to the toxic effects of DBP than female fetuses. Further, live pup weight adjusted for the total number of pups/litter tended to be lower for the pairs receiving the 1.0% DBP diet as compared to the pairs fed the control, 0.03% DBP, or 0.3% DBP diets. Since DBP exerted significant deleterious effects on fertility & reproductive performance in the F0 breeding pairs (Task 2), it was decided to conduct a crossover mating trial with the control & high dose F0 mice in order to determine whether one or both sexes were adversely affected (Task 3). Three combinations of breeding pairs were utilized in the crossover mating trial immediately following the 18-wk exposure period in Task 2. These were: Control male x Control female, 1.0% DBP male x Control female, & Control male x 1.0% DBP female. Although the proportion of detected matings did not differ significantly across the 3 combinations of breeding pairs, the proportion fertile was significantly reduced in the Control male x 1.0% DBP female pairing vs the Control male x Control female & 1.0% DBP male x Control female pairings. In addition, the number of live pups/litter, the proportion of pups born alive, & the absolute & relative live pup weights were significantly decreased for the Control male x 1.0% DBP female pairs as compared to the other two combinations of breeding pairs. As observed initially for the F0 pairs fed the 1.0% DBP diet, the proportion of live males/litter (males/total) in Task 3 tended to be higher for the Control male x 1.0% DBP female pairs relative to the other 2 pairings. Taken together, these data clearly show that the female parent & her offspring in utero were selectively affected by exposure to 1.0% DBP in the diet. The control & 1.0% DBP-exposed F0 mice were necropsied 26 days after the completion of the 7-day crossover mating trial. Sperm assessment indicated no significant difference in the % motile sperm, sperm concn, or % abnormal sperm in the cauda epididymis between male mice exposed to 0.0 or 1.0% DBP in the diet. On the other hand, body weight was significantly decreased & the relative liver weight was significantly increased in the male mice fed the 1.0% DBP- containing diet versus male mice given the control diet. In the F0 females, absolute & relative liver weight was significantly increased & absolute & relative uterine weight was significantly decreased in the 1.0% DBP-exposed group vs the combined control group. No treatment related gross or histopathologic lesions were noted for the testis, epididymis, prostate or seminal vesicles in male mice, or for the ovary, oviduct, uterus, or vagina in the female mice. Histological evaluation of the cell types in the vaginal mucosa indicated that there were no treatment-related effects on the estrous cycle. Under the conditions of this study, 1.0% DBP in the diet was a reproductive toxicant in female CD-1 mice as evidenced by decreased fertility, decreased number of litters, decreased number of live pups/litter, decreased proportion of pups born alive, decreased live pup weights, & an increased proportion of live males/litter (males/total). Uterine weight also was significantly lower in 1.0% DBP exposed females vs controls, perhaps reflecting the production of fewer & smaller litters in the DBP-treated group. Finally, liver weights were greater in 1.0% DBP-exposed males & females & body weight was significantly decreased in 1.0% DBP-fed males as compared to these same endpoints in control male & female mice.Thus, DBP is a reproductive toxicant in the presence of systemic toxicity.

TSCA Test Submissions:

Under the Toxic Substances Control Act (TSCA), EPA has broad authority to issue regulations designed to require manufacturers (including importers) or processors to test chemical substances and mixtures for health and environmental effects. This section provides information on test reports submitted for this chemical under TSCA.

>> Effects on the liver and liver lipids were evaluated in groups of male and female Fischer 344 rats (5/sex/dose level) fed nominal levels of 0, 0.6, 1.2 or 2.5% di-n-butyl phthalate in the diet for 21 days. Toxicity was evident by statistical

differences between dosed groups and controls for: mean body weights (2.5% and 1.2% group males & 2.5% group females), food consumption (2.5% group males & females), absolute and relative liver weights (all treated animals), relative kidney weights (1.2 and 2.5% group males & 2.5% group females) and absolute and relative testis weights (2.5% group males). There was a statistically significant decrease in serum cholesterol (all treated animals) and a significant decrease in serum triglycerides (all treated males), although these effects were not considered dose-related. Also observed was an significant increase in serum triglycerides for 2.5% group females. There was a moderate increase in peroxisome proliferation for the high dose animals. Liver biochemistry revealed statistically significant differences between treated and controls as indicated by cyanide-insensitive palmitoyl-CoA oxidation levels (1.2 and 2.5% group males & 2.5% group females), lauric acid 11- and 12- hydroxylase activities (all treated males & 2.5% group females) and total hepatic protein levels (0.6 and 1.2% group males, 1.2 and 2.5% group females). There was no consistent dose response relationship among treatment groups for lipid content in the liver. Histological changes attributable to di-n-butyl phthalate were reduction in cytoplasmic basophilia in the livers of the high dose rats and some of the 1.2% group males. Severe testicular atrophy was observed at the 2.5% dietary level.

12. Ecological Information

Resident Soil (mg/kg)

>> 6.30e+03

Industrial Soil (mg/kg)

>> 8.20e+04

Tapwater (ug/L)

>> 9.00e+02

MCL (ug/L)

>> 6.00e+00

Risk-based SSL (mg/kg)

>> 2.30e+00

Chronic Oral Reference Dose (mg/kg-day)

>> 1.00e-01

Volatile

>> Volatile

Mutagen

>> Mutagen

Fraction of Contaminant Absorbed in Gastrointestinal Tract

>> 1

Fraction of Contaminant Absorbed Dermally from Soil

>> 0.1

ICSC Environmental Data:

>> The substance is toxic to aquatic organisms.

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> SEDIMENT: Dibutyl phthalate was detected in 4.8% of 536 sites sampled Aug 1992 to Sept 1995 in 20 major river basins across the US with a maximum concentration of 260 ug/kg dry weight(1). Dibutyl phthalate was found in 28.7% of 429 river bed sites sampled from 19 major river basins in the US sampled from Aug 1992 to March 1995 with a maximum concentration of 310 ug/kg(2). Dibutyl phthalate was detected in sediment samples from Pensacola Bay, FL at 370 ug/kg in June 1983 and in stream drainage at 2000 ug/kg in Feb 1984(3). Dibutyl phthalate was found in 10% of sediment samples taken near 2 combined sewer overflows in the lower Passaic River in New Jersey, found in 80% at another site and not found at a 4th(4). Dibutyl phthalate was found in surface sediment samples at 4 sites in False Creek in Vancouver, Canada(5). Samples taken in the summer of 1997 in Hamilton Harbour, Ontario had concentrations of dibutyl phthalate below the reporting limit of 0.3 ng/g(6).

Fish/Seafood Concentrations:

Concentrations of this compound in fish or seafood.

>> Dibutyl phthalate was found in clams and clam worms (Neanthes virens) at 2 sites in Portland, ME at 40 and 100 ppb and 70 and 180 ppb, respectively(1). Dibutyl phthalate was not detected (<0.1 ppb) in 18 species of marine organisms from 14 locations in Mississippi Delta and coastal areas in the northwest part of the Gulf of Mexico(2). Dibutyl phthalate was detected, not quantified, in White sucker, longnose sucker and yellow perch from Nepugin Bay, Lake Superior(3), and in burbot from 2 sites in Lake Huron(4). Dibutyl phthalate was found in fish from Lake Superior (adjacent to Isle Royale, MI):in fat siscowet trout at a trace, in lean lake trout at 200 ppb and in white fish at 70 ppb(5). Reported concentrations of dibutyl phthalate in aquatic species from selected areas of North America were 0-200 ppb in channel catfish, 200 ppb in dragonfly naiads and 500 ppb in tadpoles(6). Dibutyl phthalate was found in crabs (Charybdis feriatus) at 2.3 ug/kg, 1.9 ug/kg, and 2.8 ug/kg in the leg, body and carapace, respectively(7). Three seaperch (Embiotoea lateralis) taken from False Creek, Vancouver, Canada contained 0.1-1.0 ppb of dibutyl phthalate(8). Dibutyl phthalate was found in sea lamprey tissue at 170 and 290 ug/kg in Brodhead Creek, Stroudsburg, PA and in fish tissue (trout) at 1715 and 6767 ug/kg(9). Dibutyl phthalate was identified in the soft tissue of the marine gastropod, Austrocochlea constricta, in 2 of 4 locations in New South Wales, Australia(10). Dibutyl phthalate was detected in edible fish from Wisconsin lakes and rivers at <0.02-35.0 mg/kg(11). Dibutyl phthalate was detected in fish at 0.598 ppm(12).

Animal Concentrations:

Concentrations of this compound in animals.

>> Dibutyl phthalate was detected in double crested cormorants and herring gulls at 11-19 ug/g lipid(1). Dibutyl phthalate had an average concentration of 0.0821 ug/L in 13 male and 20 female monkeys fed an artificial diet at the Primate Research Institute at Kyoto University in Japan, and an average concentration of 0.0146 ug/L in 9 male and 1 female monkeys in the wild in Chiba, Japan(2).

Average Daily Intake:

The average amount of the compound taken into the body through eating, drinking, or breathing.

>> The average daily intake of dibutyl phthalate was estimated as 0.184 ug/kg/day based on a food survey conducted in Albany, NY in 2011(1). The average daily intake of dibutyl phthalate was estimated as 30-40 ng/kg body weight/day in studies of foods and beverages purchased from Norwegian grocery stores(2). The estimated average intake of dibutyl phthalate was reported as 2.7 ug/kg body weight/day(3). Based on studies of urine and breast milk, the average daily intake of dibutyl phthalate for pregnant women, 2-3 year olds and 5-6 year olds was 0.01-0.08, 4-7 and 3-5 ug/kg body weight/day(4). The total average daily intake of dibutyl phthalate was 191.8 ng/kg body weight/day based on food, water, and indoor and outdoor air concentrations reported for Paris, France; component daily intakes were 0.87, 182 and 8.95 ng/kg body weight/day for water, food and air respectively(5). Based on analysis of urine samples from the German population, the average daily intake of dibutyl phthalate was 2.9-23.7, 3-28 and 2.1-26.2 ug/kg body weight/day in children, females and males, respectively(6). The median concentration of monobutyl phthalate in urine samples from 36 Japanese people collected May to June 2004 was 36 ug/L; this translates to an exposure rate of 1.2-2.2 ug/kg/day of the parent compound dibutyl phthalate(7).

13. Disposal Considerations

Spillage Disposal

>> Do NOT let this chemical enter the environment. Collect leaking and spilled liquid in covered containers as far as possible. Absorb remaining liquid in vermiculite, sand or inert absorbent. Then store and dispose of according to local regulations.

Disposal Methods

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number U069, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste.

>> Good candidate for incineration by liquid injection with a temperature of 650-1600 °C with a residence time of 0.1-2 seconds; rotary kiln with a temperature of 820-1,600 °C with a residence time for liquids and gases: seconds, solids: hours; fluidized bed with a temperature of 450-980 °C with a residence time for liquids and gases: seconds, solids: longer.

>> Chemical Treatability of Dibutyl Phthalate; Concentration Process: Activated Carbon; Chemical Classification: Phthalates; Scale of Study: Batch flow, Laboratory scale; Type of Wastewater Used: Pure compound (one solute in a solvent); Results

of Study: 100% reduction; 38% desorbed from carbon by elutriation with solvent; (Calgon FS-300 used. Solvents included pentane-acetone, diethyl ether, methylene chloride-acetone, chloroform-acetone, and acetone.)

>> Chemical Treatability of Dibutyl Phthalate; Concentration Process: Resin Adsorption; Chemical Classification: Phthalates; Scale of Study: Batch flow, Laboratory Scale; Type of Wastewater Used: Pure compound (one solute in a solvent; Results of Study: 100% reduction; 108% desorbed from resin by elutriation with solvent. (Amberlite XAD-2 used. Solvents included pentane- acetone, diethyl ether, methylene chloride-acetone, chloroform-acetone, and acetone.)

>> For more Disposal Methods (Complete) data for DIBUTYL PHTHALATE (6 total), please visit the HSDB record page.

14. Transport Information

DOT

Dibutyl phthalate
9
UN Pack Group: III
Reportable Quantity of 10 lb or 4

IATA

Dibutyl phthalate
9,
UN Pack Group: III

15. Regulatory Information

Clean Water Act Requirements:

The Clean Water Act (CWA) of 1972 establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. Under CWA, the U.S. Environmental Protection Agency (EPA) developed the Toxic Pollutant List (40 CFR Part 401.15) and the Priority Pollutant List (40 CFR Part 423, Appendix A). These lists are to be used by EPA and States to develop the Effluent Guidelines regulations and ensure water quality criteria and standards.

>> Protection of human health from the toxic properties of dibutyl phthalate ingested through water and contaminated organisms, the ambient water criterion is calculated at 34 mg/L.

TSCA Requirements:

This section provides information on requirements concerning this chemical under the Toxic Substances Control Act (TSCA) of 1976. TSCA provides EPA with authority to require reporting, record-keeping and testing requirements, and restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics and pesticides.

>> A testing consent order is in effect for di-n-butyl phthalate for environmental effects testing. FR citation: 1/9/89.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: 1,2-Benzenedicarboxylic acid, dibutyl ester

>> Specific Information Requirement: Obligations to provide information apply. You must tell us within 28 days if the circumstances of your importation or manufacture (introduction) are different to those in our assessment.

REACH Registered Substance

>> Status: Active Update: 31-12-2021 https://echa.europa.eu/registration-dossier/-/registered-dossier/14862

>> Status: Cease Manufacture Update: 11-02-2014 https://echa.europa.eu/registration-dossier/-/registered-dossier/1676

>> Status: Active Update: 28-04-2017 https://echa.europa.eu/registration-dossier/-/registered-dossier/1911

>> Status: Active Update: 22-07-2013 https://echa.europa.eu/registration-dossier/-/registered-dossier/1805

REACH Restricted Substance

>> Restricted substance: Dibutyl phthalate (DBP)

>> EC: 201-557-4

REACH Substances of Very High Concern (SVHC)

>> Substance: Dibutyl phthalate (DBP)

>> EC: 201-557-4

>> Date of inclusion: >28-Oct-2008

>> Reason for inclusion: Toxic for reproduction (Article 57c); Endocrine disrupting properties (Article 57(f) - environment); Endocrine disrupting properties (Article 57(f) - human health)

New Zealand EPA Inventory of Chemical Status

>> Dibutyl phthalate: Does not have an individual approval but may be used under an appropriate group standard

16. Other Information

Toxic Combustion Products:

Toxic products (e.g., gases and vapors) produced from the combustion of this chemical.

>> Carbon oxides

Other Safety Information

Chemical Assessment

>> PEC / SN / Other assessments - Dibutyl phthalate (DBP): Health

>> IMAP assessments - Phthalate esters: Environment tier II assessment

>> IMAP assessments - C4-6 side chain transitional phthalates: Human health tier II assessment

"The information provided is believed to be accurate but is not comprehensive and should be used as a reference. It reflects our current knowledge and is intended for safety guidance related to the product. This document does not constitute a warranty of the product's properties. Ionz is not responsible for any damages resulting from handling or contact with the product incorrectly."