SAFETY DATA SHEET

Updated on 15/03/2025

1. Material Identification

Product Name : Lead sulfate
Catalog Number : io-2569
CAS Number : 15739-80-7
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)

Pictogram(s)

GHS Hazard Statements

>> H302+H332 (55.3%): Harmful if swallowed or if inhaled [Warning Acute toxicity, oral; acute toxicity, inhalation]

>> H302 (100%): Harmful if swallowed [Warning Acute toxicity, oral]

>> H332 (100%): Harmful if inhaled [Warning Acute toxicity, inhalation]

>> H350 (55.8%): May cause cancer [Danger Carcinogenicity]

>> H351 (11.2%): Suspected of causing cancer [Warning Carcinogenicity]

>> H360 (55.3%): May damage fertility or the unborn child [Danger Reproductive toxicity]

>> H360Df (55.8%): May damage the unborn child; Suspected of damaging fertility [Danger Reproductive toxicity]

>> H361 (11.2%): Suspected of damaging fertility or the unborn child [Warning Reproductive toxicity]

>> H372 (11.7%): Causes damage to organs through prolonged or repeated exposure [Danger Specific target organ toxicity, repeated exposure]

>> H373 (99.5%): May causes damage to organs through prolonged or repeated exposure [Warning Specific target organ toxicity, repeated exposure]

>> H400 (99.5%): Very toxic to aquatic life [Warning Hazardous to the aquatic environment, acute hazard]

>> H410 (100%): Very toxic to aquatic life with long lasting effects [Warning Hazardous to the aquatic environment, long-term hazard]

Precautionary Statement Codes

>> P203, P260, P261, P264, P270, P271, P273, P280, P301+P317, P304+P340, P317, P318, P319, P330, P391, P405, and P501

Health Hazards:

>> INHALATION: Joint and muscle pains, headache, dizziness and insomnia. Weakness, frequently of extensor muscles of hand and wrist (unilateral or bilateral). Heavy contamination. Brain damage. Stupor progressing to coma - with or

without convulsion, often death. Excitation, confusion, and mania less common. Cerebrospinal pressure may be increased. EYES: Caused a moderat purulent reaction and general inflammation of the rabbit eye. INGESTION: Abdominal pain, diarrhea, constipation, loss of appetite, muscular weakness, headache, blue line on gums, metallic taste, nausea and vomiting. (USCG, 1999)

ERG 2024, Guide 154 (Lead sulfate, with more than 3% free acid)

>> TOXIC and/or CORROSIVE; inhalation, ingestion or skin contact with material may cause severe injury or death.

>> Contact with molten substance may cause severe burns to skin and eyes.

>> Avoid any skin contact.

>> Fire may produce irritating, corrosive and/or toxic gases.

>> Runoff from fire control or dilution water may be corrosive and/or toxic and cause environmental contamination.

>> Special Hazards of Combustion Products: Toxic metal fumes (USCG, 1999)

ERG 2024, Guide 154 (Lead sulfate, with more than 3% free acid)

>> Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

>> Some are oxidizers and may ignite combustibles (wood, paper, oil, clothing, etc.).

>> Corrosives in contact with metals may evolve flammable hydrogen gas.

>> Containers may explode when heated.

>> For electric vehicles or equipment, GUIDE 147 (lithium ion or sodium ion batteries) or GUIDE 138 (sodium batteries) should also be consulted.

3. Composition/Information On Ingredients

Chemical name : Lead sulfate
CAS Number : 15739-80-7
Molecular Formula : O4PbS
Molecular Weight : 303.0000 g/mol

4. First Aid Measures

First Aid:

>> Get medical aid.

>> INHALATION: Remove from source of exposure and keep quiet.

>> EYES: Wash with running water.

>> SKIN: Wash with soap and water.

>> INGESTION: Wash mouth, give emetic then epsom salts (30 g/250 ml hot water); get medical attention. (USCG, 1999)

ERG 2024, Guide 154 (Lead sulfate, with more than 3% free acid)

>> General First Aid:

>> Call 911 or emergency medical service.

>> Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and avoid contamination.

>> Move victim to fresh air if it can be done safely.

>> Administer oxygen if breathing is difficult.

>> If victim is not breathing:

>> DO NOT perform mouth-to-mouth resuscitation; the victim may have ingestedor inhaled the substance.

>> If equipped and pulse detected, wash face and mouth, then give artificial respiration using a proper respiratory medical device (bag-valve mask, pocket mask equipped with a one-way valve or other device).

>> If no pulse detected or no respiratory medical device available, provide continuouscompressions. Conduct a pulse check every two minutes or monitor for any signs of spontaneous respirations.

>> Remove and isolate contaminated clothing and shoes.

>> For minor skin contact, avoid spreading material on unaffected skin.

>> In case of contact with substance, remove immediately by flushing skin or eyes with running water for at least 20 minutes.

>> For severe burns, immediate medical attention is required.

>> Effects of exposure (inhalation, ingestion, or skin contact) to substance may be delayed.

>> Keep victim calm and warm.

>> Keep victim under observation.

>> For further assistance, contact your local Poison Control Center.

>> Note: Basic Life Support (BLS) and Advanced Life Support (ALS) should be done by trained professionals.

>> Specific First Aid:

>> For corrosives, in case of contact, immediately flush skin or eyes with running water for at least 30 minutes. Additional flushing may be required.

>> In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping paper and/or the "ERAP" section.

5. Fire Fighting Measures

>> Excerpt from ERG Guide 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]:

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

>> LARGE FIRE: Dry chemical, CO2, alcohol-resistant foam or water spray. 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, RAIL TANK CARS OR HIGHWAY TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Do not get water inside containers. 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)

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 154 [Substances - Toxic and/or Corrosive (Non-Combustible)]:

>> 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)

Evacuation: ERG 2024, Guide 154 (Lead sulfate, with more than 3% free acid)

>> 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

>> For non-highlighted materials: 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.

Accidental Release Measures

Public Safety: ERG 2024, Guide 154 (Lead sulfate, with more than 3% free acid)

>> CALL 911. Then call emergency response telephone number on shipping paper. If shipping paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.

>> Keep unauthorized personnel away.

>> Stay upwind, uphill and/or upstream.

>> Ventilate closed spaces before entering, but only if properly trained and equipped.

Spill or Leak: ERG 2024, Guide 154 (Lead sulfate, with more than 3% free acid)

>> ELIMINATE all ignition sources (no smoking, flares, sparks or flames) from immediate area.

>> Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

>> Stop leak if you can do it without risk.

>> Prevent entry into waterways, sewers, basements or confined areas.

>> Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

>> DO NOT GET WATER INSIDE CONTAINERS.

7. Handling And Storage

Storage Conditions:

>> Lead sulfate must be stored to avoid contact with oxidizers (such as perchlorates, peroxides, permanganates, chlorates, and nitrates) and chemically active metals (such as potassium, sodium, magnesium, and zinc) since violent reactions occur ... A regulated, marked area should be established with this chemical is handled, used, or stored ...

8. Exposure Control/ Personal Protection

>> 0.05 [mg/m3], as Pb

>> 0.05 [mg/m3], as Pb

Emergency Response: ERG 2024, Guide 154 (Lead sulfate, with more than 3% free acid)

>> Small Fire

>> Dry chemical, CO2 or water spray.

>> Large Fire

>> Dry chemical, CO2, alcohol-resistant foam or water spray.

>> 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, Rail Tank Cars or Highway Tanks

>> Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles.

>> Do not get water inside containers.

>> 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.

Acceptable Daily Intakes:

An estimate of the amount of a chemical in food or drinking water that can be consumed daily over a lifetime without presenting an appreciable risk to health. It is usually expressed as milligrams of the substance per kilogram of body weight per day and applies to chemicals such as food additives, pesticide residues and veterinary drugs.

>> Tolerable intake of lead for preschool children should be less than the 3 mg/wk recommended provisionally for adults. .../Inorganic lead/

Exposure Control and Personal Protection

Protective Clothing: ERG 2024, Guide 154 (Lead sulfate, with more than 3% free acid)

>> Wear positive pressure self-contained breathing apparatus (SCBA).

>> Wear chemical protective clothing that is specifically recommended by the manufacturer when there is NO RISK OF FIRE.

>> Structural firefighters' protective clothing provides thermal protection but only limited chemical protection.

Exposure Summary

>> Biological Exposure Indices (BEI) [ACGIH] - Lead in blood = 200 ug/L (20 ug/100 ml); sampling time not critical; [ACGIH]

9. Physical And Chemical Properties

Molecular Weight:

>> 303

Exact Mass:

>> 303.92838

Physical Description:

>> Lead sulfate appears as a white crystalline solid. Insoluble in water and sinks in water. Contact may irritate skin, eyes, and mucous membranes. May be mildly toxic by ingestion, inhalation and skin absorption. Used to make other chemicals. Use: in lithography, battery acid solution treated fabrics, used in varnishes.

Color/Form:

>> White, heavy crystal powder

Melting Point:

>> 2138 °F (USCG, 1999)

Solubility:

>> In water, 0.0404 g/100 mL at 25 °C; slightly soluble in alkaline solutions.

Density:

>> 6.2 at 68 °F (USCG, 1999) - Denser than water; will sink

Decomposition:

>> When heated to decomposition it emits very toxic fumes /of lead and sulfur oxides./

Refractive Index:

>> Index of refraction: 1.877, 1.822, 1.894

10. Stability And Reactivity

>> Insoluble in water.

11. Toxicological Information

Toxicity Summary:

>> Lead mimics other biologically important metals, such as zinc, calcium, and iron, competing as cofactors for many of their respective enzymatic reactions. For example, lead has been shown to competitively inhibit calcium's binding of calmodulin, interferring with neurotransmitter release. It exhibits similar competitive inhibition at the NMDA receptor and protein kinase C, which impairs brain microvascular formation and function, as well as alters the blood-brain barrier.

Lead also affects the nervous system by impairing regulation of dopamine synthesis and blocking evoked release of acetylcholine. However, it's main mechanism of action occurs by inhibiting delta-aminolevulinic acid dehydratase, an enzyme vital in the biosynthesis of heme, which is a necesssary cofactor of hemoglobin. (T4, A20, A22, L136)

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).

>> Lead, lead compounds: Reasonably anticipated to be a human carcinogen

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).

>> 2A, probably carcinogenic to humans. (L135)

Health Effects:

>> Lead is a neurotoxin and has been known to cause brain damage and reduced cognitive capacity, especially in children. Lead exposure can result in nephropathy, as well as blood disorders such as high blood pressure and anemia. Lead also exhibits reproductive toxicity and can results in miscarriages and reduced sperm production. (L21)

Exposure Routes:

>> Oral (L136) ; inhalation (L136); dermal (L136)

>> Symptions of chronic lead poisoning include reduced cognitive abilities, nausea, abdominal pain, irritability, insomnia, metal taste in the mouth, excess lethargy or hyperactivity, chest pain, headache and, in extreme cases, seizures, comas, and death. There are also associated gastrointestinal problems, such as constipation, diarrhea, vomiting, poor appetite, weight loss, which are common in acute poisoning. (A2, L21)

Adverse Effects:

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

>> Neurotoxin - Predominantly motor

>> Occupational hepatotoxin - Secondary hepatotoxins: the potential for toxic effect in the occupational setting is based on cases of poisoning by human ingestion or animal experimentation.

>> Nephrotoxin - The chemical is potentially toxic to the kidneys in the occupational setting.

>> 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.

>> Dermatotoxin - Skin burns.

>> IARC Carcinogen - Class 2: International Agency for Research on Cancer classifies chemicals as probable (2a), or possible (2b) human carcinogens.

>> NTP Carcinogen - Reasonably anticipated to be a human carcinogen.

>> ACGIH Carcinogen - Confirmed Animal.

Toxicity Data:

>> LD50: 300 mg/kg (Intraperitoneal, Guinea pig) (T57)

Minimum Risk Level:

The minimal risk level (MRL) is an estimate of the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health

>> Chronic Inhalation: 0.05 mg/m3 (L134)

Treatment:

Treatment when exposed to toxin

>> Lead poisoning is usually treated with chelation therapy using DMSA, EDTA, or dimercaprol. (L21)

Antidote and Emergency Treatment:

>> Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway

and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Lead and related compounds/

Human Toxicity Excerpts:

>> /SIGNS AND SYMPTOMS/ This chemical is corrosive. Skin contact can cause severe irritation and burns, itching, rash, and pigment changes. Eye contact can cause severe irritation and burns. Inhalation can cause irritation of the respiratory tract. Ingestion of large amounts of lead may lead to seizures, coma, and death. The effects of exposure to fumes and dusts of inorganic lead may not develop quickly. Symptoms may include decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, constipation, abdominal pains, and decreased appetite.

Non-Human Toxicity Excerpts:

>> /LABORATORY ANIMALS: Acute Exposure/ ... Lead sulfate placed in the anterior chamber of rabbits /eyes/ has caused a moderate purulent reaction and general inflammation of the eye.

Non-Human Toxicity Values:

>> LD50 Guinea pig ip 300 mg/kg

12. Ecological Information

Sediment/Soil Concentrations:

Concentrations of this compound in sediment/soil.

>> The principal form of lead from along roadsides is the sulfate salt(1). In a calcareous soil, $PbSO_4$ and $PbCO_3$ were shown to account for <5% of the total lead content, whereas in road side dust, $PbSO_4$, elemental lead, Pb_3O_4, $PbO.PbSO_4$ and $2PbCO_3.Pb(OH)_2$ were present in high quantities(2).

13. Disposal Considerations

Disposal Methods

>> Generators of waste (equal to or greater than 100 kg/mo) containing this contaminant, EPA hazardous waste number D008, must conform with USEPA regulations in storage, transportation, treatment and disposal of waste. /Lead/

14. Transport Information

DOT

Lead sulfate

Reportable Quantity of 10 lb or 4

IATA

Lead sulfate

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15. Regulatory Information

Federal Drinking Water Standards:

Federal drinking water standards (e.g. maximum containment level (MCL)) for this chemical. These standards are legally enforceable.

>> EPA 15 ug/L (Action Level) /Lead/

State Drinking Water Standards:

State drinking water standards (e.g. maximum containment level (MCL)) for this chemical. These standards are legally enforceable.

>> (AZ) ARIZONA 50 ug/L /Lead/

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.

>> Lead sulfate is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

Regulatory Information

The Australian Inventory of Industrial Chemicals

>> Chemical: Sulfuric acid, lead(2+) salt (1:1)

>> Conditions Of Use:

>> This chemical must not be imported or manufactured for use in any:

>> industrial surface coating or as a component of industrial surface coatings at concentrations greater than 0.1%*

>> ink or as a component of inks at concentrations greater than 0.1%*, when intended for industrial uses

>> *calculated on the non-volatile component of the surface coating or ink

>> 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.

The Australian Inventory of Industrial Chemicals

>> Chemical: Sulfuric acid, lead salt

The Australian Inventory of Industrial Chemicals

>> Chemical: Sulfuric acid, lead salt, tetrabasic

REACH Registered Substance

>> Status: Cease Manufacture Update: 16-09-2010 https://echa.europa.eu/registration-dossier/-/registered-dossier/11201

REACH Restricted Substance

>> Restricted substance: Lead sulphate PbSO4

>> EC: 231-198-9

REACH Restricted Substance

>> Restricted substance: Sulphuric acid, lead salt Pbx SO4

>> EC: 239-831-0

REACH Restricted Substance

>> Restricted substance: Sulfuric acid, lead salt, tetrabasic

>> EC: 258-142-6

REACH Restricted Substance

>> Restricted substance: Sulfuric acid, lead(2+) salt, basic

>> EC: 292-204-3

16. Other Information

Toxic Combustion Products:

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

>> Poisonous fumes including lead and sulfur oxides are produced in fire.

Other Safety Information

Chemical Assessment

>> IMAP assessments - Selected lead-based pigments: Human health tier II assessment

Chemical Assessment

>> IMAP assessments - Selected lead-based pigments: Human health tier II assessment

>> PEC / SN / Other assessments - Lead compounds used in industrial surface coatings and inks: Health

Chemical Assessment

>> IMAP assessments - Selected lead-based pigments: 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."