Safety Data Sheet LEAD (IV) OXIDE

SDS no. WQT77J9G • Version 1.0 • Date of issue: 2023-07-04

SECTION 1: Identification

GHS Product identifier

Product name	LEAD (IV) OXIDE

Recommended use of the chemical and restrictions on use

Oxidizing agent, electrodes in batteries, lead-acid storage batteries, curing agent for polysulfide elastomers, manufacture of rubber substitutes, manufacture of pigments, textiles (mordant, discharge in dyeing with indigo), matches, pyrotechny, explosives, analytical chemistry and laboratory reagent.

Supplier's details

Name	ChemSupply Australia Pty Ltd
Address	38-50 Bedford Street 5013 Gillman South Australia Australia
Telephone	08 8440 2000
email	www.chemsupply.com.au

Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

SECTION 2: Hazard identification

General hazard statement

Classified as dangerous goods according to the Australian Dangerous Goods Code (ADG).

Classified as Hazardous according to the Globally Harmonised System of classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

Classification of the substance or mixture

GHS classification in accordance with: UN GHS revision 7

- Oxidizing solids, Cat. 3
- Toxic to reproduction, Cat. 1
- Carcinogenicity, Cat. 2
- Germ cell mutagenicity, Cat. 2
- Specific target organ toxicity following repeated exposure, Cat. 2
- Hazardous to the aquatic environment, short-term (acute), Cat. 1

- Hazardous to the aquatic environment, long-term (chronic), Cat. 1

GHS label elements, including precautionary statements

Pictograms

Signal word	**Danger**

Hazard statement(s)

H272	May intensify fire; oxidizer
H341	Suspected of causing genetic defects
H351	Suspected of causing cancer
H360	May damage fertility or the unborn child
H373	May cause damage to organs through prolonged or repeated exposure
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220	Keep away from clothing and other combustible materials.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P308+P313	IF exposed or concerned: Get medical advice/attention.
P314	Get medical advice/attention if you feel unwell.
P370+P378	In case of fire: Use agents recommended in Section 5 of SDS for extinction
P391	Collect spillage.
P501	Dispose of contents/container to an approved waste disposal facility

SECTION 3: Composition/information on ingredients

Mixtures

Molecular weight: 239.19

Components

Component	CAS no.	Concentration
Lead dioxide (EC no.: 215-174-5)	**1309-60-0**	**100 % (weight)**
CLASSIFICATIONS: Carcinogenicity, Cat. 2; Germ cell mutagenicity, Cat. 2; Specific target organ toxicity following repeated exposure, Cat. 2; Toxic to reproduction, Cat. 1. HAZARDS: H341 - Suspected of causing genetic defects [route]; H351 - Suspected of causing cancer [route]; H360 - May damage fertility or the unborn child [effect, route]; H373 - May cause damage to organs [organs] through prolonged or repeated exposure [route].		

SECTION 4: First-aid measures

Description of necessary first-aid measures

If inhaled	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Consult a physician.

In case of skin contact	Immediately remove contaminated clothing and wash affected area with water for at least 15 minutes. Ensure contaminated clothing is washed before re-use. Seek immediate medical advice /attention depending on the severity.
In case of eye contact	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open.In all cases of eye contamination it is a sensible precaution to seek medical advice.
If swallowed	Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek medical advice if effects persist.

Most important symptoms/effects, acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of immediate medical attention and special treatment needed, if necessary
For advice in an emergency, contact a Poisons Information Centre (Phone Australia 131 126) or a doctor at once.

SECTION 5: Fire-fighting measures

Suitable extinguishing media
Small fire: USE FLOODING QUANTITIES OF WATER. Do not use dry chemicals, CO2 or foam. If safe to do so, move undamaged containers from fire area. Do not move cargo if cargo has been exposed to heat.
Large fire: Flood fire area with water from a protected position. Cool containers with flooding quantities of water until well after fire is out - If impossible, withdraw from area and let fire burn. Avoid getting water inside containers: a violent reaction may occur. Dam fire control water for later disposal.

Specific hazards arising from the chemical
Will accelerate burning when involved in a fire. May explode from heating, shock, friction or contamination. Some will react explosively with hydrocarbons (fuels). May ignite combustibles (wood, paper, clothing, etc). Fire may produce irritating, poisonous, and/or corrosive gases. Containers may explode when heated. Runoff may create fire or explosion hazard.

Special protective actions for fire-fighters
Fire fighters should wear full protective clothing and self-contained breathing apparatus (SCBA) operated in positive pressure mode. Fight fire from safe location.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Ensure adequate ventilation. Use personal protective equipment. Avoid dust formation. For personal protection see section 8.

Methods and materials for containment and cleaning up
Do not contaminate. Keep combustibles (wood, paper, clothing, oil, etc.) away from spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use water spray to knock down vapours or divert vapour clouds. Prevent entry into waterways, drains or confined areas. Prevent exposure to heat.
Dry Spill Use clean non-sparking tools to transfer material to a clean, dry plastic container and cover loosely. Move container from spill area.
Small Liquid Spill Use a non-combustible material like vermiculite, sand or earth to soak up the product and place in a loosely-covered container for later disposal.
Large Liquid Spill SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.

SECTION 7: Handling and storage

Precautions for safe handling
Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure. Avoid exposure - obtain special instructions before use. Wear suitable protective clothing.

Conditions for safe storage, including any incompatibilities
Store away from combustible materials. Keep container tightly closed and dry, away from direct sunlight. Store at room temperature (15 - 25 °C). Store away from foodstuffs.

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls
Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits.f the engineering controls are not sufficient to maintain concentrations of vapours/mists below the exposure standards, suitable respiratory protection must be worn.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Skin protection
Clean impervious clothing should be worn. Clothing for protection against
chemicals should comply with AS 3765 Clothing for Protection Against Hazardous
Chemicals.

Hand Protection: Ensure hand protection complies with AS 2161, Occupational protective gloves - Selection, use and maintenance.

Body protection
Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled.

Respiratory protection
If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/ mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/ NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

SECTION 9: Physical and chemical properties

Basic physical and chemical properties

Physical state	Solid
Appearance	Brown crystals or powder.
Color	No data available.
Odor	Odourless.
Odor threshold	No data available.
Melting point/freezing point	290 °C - decomposes
Boiling point or initial boiling point and boiling range	No data available.
Flammability	No data available.
Lower and upper explosion limit/flammability limit	No data available.
Flash point	290 °C

Explosive properties	No data available.
Auto-ignition temperature	No data available.
Decomposition temperature	290 °C.
Oxidizing properties	An oxidizing agent.
pH	No data available.
Kinematic viscosity	No data available.
Solubility	Solubility in Water: Insoluble. Solubility in Organic Solvents: Insoluble in alcohol. Presumably soluble in acidic gastric juice.
Partition coefficient n-octanol/water (log value)	No data available.
Vapor pressure	No data available.
Evaporation rate	No data available.
Density and/or relative density	Specific Gravity: 9.375
Relative vapor density	8.2
Particle characteristics	No data available.

Supplemental information regarding physical hazard classes
No data available.

Further safety characteristics (supplemental)
Other Information: Soluble in glacial acetic acid.

SECTION 10: Stability and reactivity

Reactivity
Stable under normal conditions of storage and handling.

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
Reacts violently with combustible and reducing materials.

Conditions to avoid
Heat, shock, friction, incompatibles, combustible materials, reducing agents, strong oxidants.

Incompatible materials
Combustible and organic materials, reducing material, aluminium carbide, barium sulfide, boron calcium sulfide, cesium, acetylene, carbide, chlorine trifluoride, hydrogen peroxide, hydrogen sulfide, hydroxylamine, molybdenum, performic acid, peroxyformic acid, phenyl hydrazine, phosphorus, phosphorus trichloride, sulfides, sulfur, sulfuryl chloride, sulfuric acid, hydrochloric acid, red phosphorous, tungsten, aluminium in powder form, metals in powder form, combustible substances, carbides, boron, alkali metals, semimetals, sulfur oxides, hydrides and zirconium.

Hazardous decomposition products
Decomposes to oxygen and lead oxide at 290C (554F), lead monoxide at higher temperatures.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity
Ingestion: Harmful if swallowed. The following applies to lead compounds in general: Due to the poor absorbability via the gastrointestinal tract, only very high doses lead to acute cases of intoxication. After a latency period of several hours, symptoms may include metallic

taste, gastrointestinal irritation, nausea, vomiting, diarrhoea, abdominal pain and spasms, kidney damage, headache, palor, constipation, joint and muscle pain, weakness of the extensor muscles (frequently the hand and wrist), <qt>lead line<qt> on the gums, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases. Many lead compounds can cause toxic effects in the blood-forming organs, kidneys, digestive and central nervous system. The synthesis of hemoglobin is inhibited and results in anaemia. If left untreated, neuromuscular dysfunction, possible paralysis, and encephalopathy can result. High body levels produce increased cerebrospinal pressure, brain damage, and stupor leading to coma and often death.

Inhalation: Harmful by inhalation. Evaporation at 20 °C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed, especially if powdered. Irritating to the respiratory tract, lungs, bronchia and mucus membranes. May cause sore throat, coughing, headache and dizziness. Lead can be absorbed through the respiratory system. In cases of acute exposure, symptoms such as metallic taste, gastrointestinal irritation with nausea, vomiting and diarrhoea, muscle weakness, <qt>lead line<qt> on the gums, definite loss of appetite, insomnia, dizziness, chest and abdominal pain and spasms, constipation, kidney damage and increased lead levels in blood and urine with shock, coma and death in extreme cases. Many lead compounds can cause toxic effects in the blood-forming organs, kidneys and central nervous system.

Skin corrosion/irritation
In general, lead compounds are not considered irritating to skin (REACH). No effects were reported in skin irritation assays in rabbits citing OECD TG 404 for lead dioxide (CAS No: 1309-60-0), lead oxide, red (CAS No: 1314-41-6) and lead monoxide (CAS No: 1317-36-8).

Serious eye damage/irritation
In general, lead compounds were not reported to be irritating to eyes or having caused serious eye damage (REACH). No effects were reported in eye irritation assays in rabbits citing OECD TG 405 for lead dioxide (CAS No: 1309-60-0), lead oxide, red (CAS No: 1314-41-6) and lead monoxide (CAS No: 1317-36-8).
Observation in humans.
No studies were located that recorded skin or eye irritation in humans as a result of exposure to lead compounds.

Respiratory or skin sensitization
Several lead compounds, including lead dioxide (CAS No: 1309-60-0), lead oxide, red (CAS No: 1314-41-6) and lead monoxide (CAS No: 1317-36-8) were reported to be non-sensitisers (REACH). It was reported that the compounds gave negative results for skin sensitisation in guinea pigs when tested according to OECD TG 406.

Germ cell mutagenicity
Suspected of causing genetic defects - Cat. 2 (H341)

Carcinogenicity
Lead compounds, inorganic is evaluated in the IARC Monographs (Vol. 87; in preparation) as Group 2A: Probably carcinogenic to humans.

Reproductive toxicity
May damage the unborn child. Suspected of damaging fertility

Specific target organ toxicity (STOT) - single exposure
No data available.

Specific target organ toxicity (STOT) - repeated exposure
May cause damage to organs through prolonged or repeated exposure

Aspiration hazard
No data available.

Additional information
Chronic Effects: Lead is a cumulative poison and exposure even to small amounts can raise the body's content to toxic levels. Repeated or prolonged exposure to the substance can produce damage to blood, kidneys, mucous membranes, the nervous and digestive systems. Over-exposure by skin contact may cause skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Other

symptoms may include anaemia, central-nervous disorders, neuromuscular dysfunction, possible paralysis and encephalopathy, joint and muscle pain, weakness of the extensor muscles (frequently the hand and wrist), kidney and liver damage, impaired eyesight, memory loss, plumbism which is characterized by lead (or blue) line in gum, metallic taste, headache, dizziness, abdominal pain, nausea, vomiting, diarrhoea, constipation, insomnia, restlessness, irritability, visual disturbances, hypertension and gray facial colour. High body levels produce increased cerebrospinal pressure, brain damage, stupor leading to coma and often death.

NICNAS: Lead oxides: Human health tier II assessment.

Lead dioxide: *TOXICITY:
typ. dose mode specie amount unit other
LD50 IPR GPG 220 MG/KG

*AQTX/TLM96: Not available

*SAX TOXICITY EVALUATION: Not available

*CARCINOGENICITY:
Review: IARC Cancer Review: Human Inadequate Evidence
IARC Cancer Review: Animal Sufficient Evidence
IARC possible human carcinogen (Group 2B) [610]

*MUTAGENICITY: Not available

*TERATOGENICITY: Not available

*STANDARDS, REGULATIONS & RECOMMENDATIONS:
OSHA: Federal Register (1/19/89) and 29 CFR 1910.1000 Subpart Z
PEL-TWA 0.05 mg(Pb)/m3 [610]
Action level TWA 0.03 mg(Pb)/m3 [610]
ACGIH: TLV-TWA 0.15 mg(Pb)/m3 [610]
NIOSH Criteria Document: Recommended Exposure Limit to Lead, inorganic-air:
TWA <0.1 mg(Pb)/m3 [610]
NFPA Hazard Rating: Health (H): None
Flammability (F): None
Reactivity (R): None

*OTHER TOXICITY DATA: None

SECTION 12: Ecological information

Toxicity
Highly toxic for aquatic organisms. May cause long-term adverse effects in the aquatic environment. Hazard for drinking water supplies.

Persistence and degradability
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Bioaccumulative potential
For lead and inorganic lead compounds: This material may bioaccumulate to some extent.The following applies to lead compounds in general: biological effects: toxic for aquatic organisms (calc. as free lead).

SECTION 13: Disposal considerations

Disposal methods

Product disposal
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

Sewage disposal
For lead and inorganic lead compounds: This material may bioaccumulate to some extent.

Other disposal recommendations
Do not discharge this material into waterways, drains and sewers.

SECTION 14: Transport information

ADG (Road and Rail)
UN Number: 1872
Class: 5.1
Packing Group: III
Proper Shipping Name: LEAD DIOXIDE

Hazchem emergency action code (EAC)
2Z

IMDG
UN Number: 1872
Class: 5.1
Packing Group: III
EMS Number:
Proper Shipping Name: LEAD DIOXIDE

IATA
UN Number: 1872
Class: 5.1
Packing Group: III
Proper Shipping Name: LEAD DIOXIDE

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

Australia SUSMP
Poison Schedule: S6

SECTION 16: Other information

Further information/disclaimer
ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the

provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

Preparation information

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Standard for the Uniform Scheduling of Medicines and Poisons, Commonwealth of Australia
National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'
Safe Work Australia, 'National Code of Practice fot the Preparation of Safety Data Sheets for Hazardous Chemicals', July 2020.
Safe Work Australia, 'National Guide for Classifying Hazardous Chemicals', July 2020.
Safe Work Australia, Workplace Exposure Standards for Airbourne Contaminants, December 2019
Safe Work Australia, Hazardous Chemical Information System (HCIS), hcis.safeworkaustralia.gov.au
IATA, Dangerous Goods Regulations (DGR)
IMO, International Maritime Dangerous Goods Code (IMDG)