

## 1 Identification

### Product identifier

**Product name:** Lead(II,IV) oxide

**Stock number:** 14232

**CAS Number:**

1314-41-6

**EC number:**

215-235-6

**Index number:**

082-001-00-6

**Relevant identified uses of the substance or mixture and uses advised against.** No further relevant information available.

**Identified use:** SU24 Scientific research and development

### Details of the supplier of the safety data sheet

#### Manufacturer/Supplier:

Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

**Information Department:** Health, Safety and Environmental Department

#### Emergency telephone number:


During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

## 2 Hazard(s) identification

### Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

 GHS03 Flame over circle

Ox. Sol. 3 H272 May intensify fire; oxidizer.

 GHS08 Health hazard

Repr. 1A H360 May damage fertility or the unborn child.

STOT RE 2 H373 May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

 GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Acute Tox. 4 H332 Harmful if inhaled.

**Hazards not otherwise classified** No information known.

### Label elements

**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

#### Hazard pictograms



GHS03 GHS07 GHS08

### Signal word

**Danger**

### Hazard statements

H272 May intensify fire; oxidizer.

H302+H332 Harmful if swallowed or if inhaled.

H360 May damage fertility or the unborn child.

H373 May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

### Precautionary statements

P221 Take any precaution to avoid mixing with combustibles.

P210 Keep away from heat. - No smoking.

P260 Do not breathe dust/fume/gas/mist/vapors/spray.

P201 Obtain special instructions before use.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

### WHMIS classification

C - Oxidizing materials

D1B - Toxic material causing immediate and serious toxic effects

D2A - Very toxic material causing other toxic effects



### Classification system

**HMIS ratings (scale 0-4)**

**(Hazardous Materials Identification System)**

**HEALTH** 2 Health (acute effects) = 2

**FIRE** 0 Flammability = 0

**REACTIVITY** 2 Physical Hazard = 2

### Other hazards

**Results of PBT and vPvB assessment**

**PBT:** Not applicable.

**Product name: Lead(II,IV) oxide**

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vPvB: Not applicable.

### 3 Composition/information on ingredients

**Chemical characterization: Substances**

**CAS# Description:**

1314-41-6 Lead(II,IV) oxide

**Concentration:** ≤100%

**Identification number(s):**

**EC number:** 215-235-6

**Index number:** 082-001-00-6

### 4 First-aid measures

**Description of first aid measures**

**After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.

Seek immediate medical advice.

**After skin contact**

Immediately wash with water and soap and rinse thoroughly.

Seek immediate medical advice.

**After eye contact** Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing** Seek medical treatment.

**Information for doctor**

**Most important symptoms and effects, both acute and delayed**

Harmful if swallowed.

Harmful if inhaled.

May damage fertility or the unborn child.

May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral,

Inhalation.

**Indication of any immediate medical attention and special treatment needed** No further relevant information available.

### 5 Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing agents**

Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Product is not flammable. Use fire-fighting measures that suit the surrounding fire.

**For safety reasons unsuitable extinguishing agents** Halocarbon extinguisher

**Special hazards arising from the substance or mixture**

This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

If this product is involved in a fire, the following can be released:

Lead oxide fume

**Advice for firefighters**

**Protective equipment:**

Wear self-contained respirator.

Wear fully protective impervious suit.

### 6 Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

**Environmental precautions:** Do not allow material to be released to the environment without proper governmental permits.

**Methods and material for containment and cleaning up:**

Dispose of contaminated material as waste according to section 13.

Ensure adequate ventilation.

**Prevention of secondary hazards:**

Acts as an oxidizing agent on organic materials such as wood, paper and fats

Keep away from combustible material.

**Reference to other sections**

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

**Protective Action Criteria for Chemicals**

**PAC-1:** 0.17 mg/m<sup>3</sup>

**PAC-2:** 130 mg/m<sup>3</sup>

**PAC-3:** 770 mg/m<sup>3</sup>

### 7 Handling and storage

**Handling**

**Precautions for safe handling**

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Open and handle container with care.

**Information about protection against explosions and fires:**

Substance/product can reduce the ignition temperature of flammable substances.

This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.

**Conditions for safe storage, including any incompatibilities**

**Storage**

**Requirements to be met by storerooms and receptacles:** No special requirements.

**Information about storage in one common storage facility:**

Store away from flammable substances.

Store away from reducing agents.

Do not store with organic materials.

Store away from metal powders.

**Further information about storage conditions:**

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

**Specific end use(s)** No further relevant information available.

**Product name: Lead(II,IV) oxide**

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## 8 Exposure controls/personal protection

### Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

### Control parameters

#### Components with limit values that require monitoring at the workplace:

##### 1314-41-6 Lead(II,IV) oxide (100.0%)

PEL (USA)	Long-term value: 0.05 mg/m <sup>3</sup> as Pb; See 29 CFR 1910.1025
REL (USA)	Long-term value: 0.05* mg/m <sup>3</sup> as Pb;*8-hr TWA; See Pocket Guide App. C
TLV (USA)	Long-term value: 0.05 mg/m <sup>3</sup> as Pb; BEI
EL (Canada)	Long-term value: 0.05 mg/m <sup>3</sup> as Pb; IARC 2A, R
EV (Canada)	Long-term value: 0.05 mg/m <sup>3</sup> as Pb, Skin (organic compounds)

#### Ingredients with biological limit values:

##### 1314-41-6 Lead(II,IV) oxide (100.0%)

BEI (USA)	30 µg/100 ml Medium: blood Time: not critical Parameter: Lead
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**Additional information:** No data

### Exposure controls

#### Personal protective equipment

#### General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Maintain an ergonomically appropriate working environment.

**Breathing equipment:** Use suitable respirator when high concentrations are present.

#### Recommended filter device for short term use:

Use a respirator with type P100 (USA) or P3 (EN 143) cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards.

#### Protection of hands:

Impervious gloves

Check protective gloves prior to each use for their proper condition.

The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

**Material of gloves** Nitrile rubber, NBR

**Penetration time of glove material (in minutes)** Not determined

**Eye protection:** Safety glasses with side shields / NIOSH (US) or EN 166(EU)

**Body protection:** Protective work clothing.

## 9 Physical and chemical properties

### Information on basic physical and chemical properties

#### General Information

##### Appearance:

<b>Form:</b>	Powder
<b>Odor:</b>	Odorless
<b>Odor threshold:</b>	Not determined.

**pH-value:** Not applicable.

#### Change in condition

<b>Melting point/Melting range:</b>	ca 500 °C (ca 932 °F) (dec)
<b>Boiling point/Boiling range:</b>	Not determined
<b>Sublimation temperature / start:</b>	Not determined
<b>Flammability (solid, gaseous)</b>	Contact with combustibile material may cause fire.
<b>Ignition temperature:</b>	Not determined
<b>Decomposition temperature:</b>	Not determined
<b>Auto igniting:</b>	Not determined.

**Danger of explosion:** Not determined.

#### Explosion limits:

<b>Lower:</b>	Not determined
<b>Upper:</b>	Not determined
<b>Vapor pressure at 943 °C (1729 °F):</b>	1.33 hPa (1 mm Hg)
<b>Density at 20 °C (68 °F):</b>	9.1 g/cm <sup>3</sup> (75.94 lbs/gal)
<b>Relative density</b>	Not determined.
<b>Vapor density</b>	Not applicable.
<b>Evaporation rate</b>	Not applicable.

#### Solubility in / Miscibility with

**Water:** Insoluble

**Partition coefficient (n-octanol/water):** Not determined.

#### Viscosity:

**dynamic:** Not applicable.

**kinematic:** Not applicable.

**Other information** No further relevant information available.

## 10 Stability and reactivity

**Reactivity** May intensify fire; oxidizer.

**Chemical stability** Stable under recommended storage conditions.

**Thermal decomposition / conditions to be avoided:** Decomposition will not occur if used and stored according to specifications.

#### Possibility of hazardous reactions

Reacts with reducing agents

Reacts with flammable substances

(Contd. on page 4)  
USA

**Product name: Lead(II,IV) oxide**

(Contd. of page 3)

**Conditions to avoid** No further relevant information available.

**Incompatible materials:**

- Reducing agents
- Flammable substances
- Organic materials
- Metal powders

**Hazardous decomposition products:** Lead oxide fume

**11 Toxicological information**

**Information on toxicological effects**

**Acute toxicity:**

- Harmful if inhaled.
- Harmful if swallowed.
- The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.

**LD/LC50 values that are relevant for classification:** No data

**Skin irritation or corrosion:** May cause irritation

**Eye irritation or corrosion:** May cause irritation

**Sensitization:** No sensitizing effects known.

**Germ cell mutagenicity:** No effects known.

**Carcinogenicity:**

- EPA-B2: Probable human carcinogen, sufficient evidence from animal studies; inadequate evidence or no data from epidemiologic studies.
- NTP-R: Reasonably anticipated to be a carcinogen: limited evidence from studies in humans or sufficient evidence from studies in experimental animals.
- ACGIH A3: Animal carcinogen: Agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.
- IARC-2A: Probably carcinogenic to humans: limited human evidence; sufficient evidence in experimental animals

**Reproductive toxicity:** May damage fertility or the unborn child.

**Specific target organ system toxicity - repeated exposure:**

May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

**Specific target organ system toxicity - single exposure:** No effects known.

**Aspiration hazard:** No effects known.

**Subacute to chronic toxicity:** No effects known.

**Additional toxicological information:** To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

**12 Ecological information**

**Toxicity**

- Aquatic toxicity:** No further relevant information available.
- Persistence and degradability** No further relevant information available.
- Bioaccumulative potential** No further relevant information available.
- Mobility in soil** No further relevant information available.

**Ecotoxicological effects:**

**Remark:** Very toxic for aquatic organisms

**Additional ecological information:**

**General notes:**

- Do not allow material to be released to the environment without proper governmental permits.
- Do not allow product to reach ground water, water course or sewage system, even in small quantities.
- Danger to drinking water if even extremely small quantities leak into the ground.
- Also poisonous for fish and plankton in water bodies.
- May cause long lasting harmful effects to aquatic life.
- Avoid transfer into the environment.
- Very toxic for aquatic organisms

**Results of PBT and vPvB assessment**

**PBT:** Not applicable.

**vPvB:** Not applicable.

**Other adverse effects** No further relevant information available.

**13 Disposal considerations**

**Waste treatment methods**

**Recommendation** Consult state, local or national regulations to ensure proper disposal.

**Uncleaned packagings:**

**Recommendation:** Disposal must be made according to official regulations.

**14 Transport information**

**UN-Number**  
**DOT, IMDG, IATA**

UN1479

**UN proper shipping name**

**DOT**  
**ADR**  
**IMDG, IATA**

Oxidizing solid, n.o.s. (Lead(II,IV) oxide)  
1479 Oxidizing solid, n.o.s. (Lead(II,IV) oxide)  
OXIDIZING SOLID, N.O.S. (Lead(II,IV) oxide)

**Transport hazard class(es)**

**DOT**



**Class**  
**Label**  
**ADR**

5.1 Oxidizing substances  
5.1




**Class**

5.1 (O2) Oxidizing substances

(Contd. on page 5)  
USA

**Product name: Lead(II,IV) oxide** (Contd. of page 4)

<b>Label</b> <b>IMDG, IATA</b>	5.1
	
<b>Class</b> <b>Label</b>	5.1 Oxidizing substances 5.1
<b>Packing group</b> <b>DOT, ADR, IMDG, IATA</b>	II
<b>Environmental hazards:</b>	Not applicable.
<b>Special precautions for user</b> <b>EMS Number:</b> <b>Stowage Category</b> <b>Segregation Code</b>	Warning: Oxidizing substances F-A,S-Q B SG38 Stow "separated from" ammonium compounds. SG49 Stow "separated from" cyanides SG60 Stow "separated from" peroxides SG61 Stow "separated from" powdered metals
<b>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</b>	Not applicable.
<b>Transport/Additional information:</b>	
<b>DOT</b> <b>Quantity limitations</b>	On passenger aircraft/rail: 5 kg On cargo aircraft only: 25 kg
<b>Marine Pollutant (DOT):</b>	No
<b>IMDG</b> <b>Limited quantities (LQ)</b> <b>Excepted quantities (EQ)</b>	1 kg Code: E2 Maximum net quantity per inner packaging: 30 g Maximum net quantity per outer packaging: 500 g
<b>UN "Model Regulation":</b>	UN 1479 OXIDIZING SOLID, N.O.S. (LEAD(II,IV) OXIDE), 5.1, II

**15 Regulatory information**

**Safety, health and environmental regulations/legislation specific for the substance or mixture**  
**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)  
**Hazard pictograms**



GHS03 GHS07 GHS08

**Signal word** Danger

**Hazard statements**

H272 May intensify fire; oxidizer.  
H302+H332 Harmful if swallowed or if inhaled.  
H360 May damage fertility or the unborn child.  
H373 May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral, Inhalation.

**Precautionary statements**

P221 Take any precaution to avoid mixing with combustibles.  
P210 Keep away from heat. - No smoking.  
P260 Do not breathe dust/fume/gas/mist/vapors/spray.  
P201 Obtain special instructions before use.  
P405 Store locked up.  
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.  
All components of this product are listed on the Canadian Domestic Substances List (DSL).

**SARA Section 313 (specific toxic chemical listings)**

1314-41-6 | Lead(II,IV) oxide

**California Proposition 65**

**Prop 65 - Chemicals known to cause cancer**

1314-41-6 | Lead(II,IV) oxide

**Prop 65 - Developmental toxicity** Substance is not listed.

**Prop 65 - Developmental toxicity, female** Substance is not listed.

**Prop 65 - Developmental toxicity, male** Substance is not listed.

**Information about limitation of use:** For use only by technically qualified individuals.

**Other regulations, limitations and prohibitive regulations**

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.**

This substance is included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH).

**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**

Substance is not listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)** Substance is not listed.

**Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

**16 Other information**

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department

**Date of preparation/Revision:** Print date, revision date and version number are in the header of each page.

**Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

ICAO: International Civil Aviation Organisation

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

**Product name: Lead(II,IV) oxide**

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DOT: US Department of Transportation  
IATA: International Air Transport Association  
EINECS: European Inventory of Existing Commercial Chemical Substances  
CAS: Chemical Abstracts Service (division of the American Chemical Society)  
HMIS: Hazardous Materials Identification System (USA)  
WHMIS: Workplace Hazardous Materials Information System (Canada)  
LC50: Lethal concentration, 50 percent  
LD50: Lethal dose, 50 percent  
PBT: Persistent, Bioaccumulative and Toxic  
SVHC: Substances of Very High Concern  
vPvB: very Persistent and very Bioaccumulative  
ACGIH: American Conference of Governmental Industrial Hygienists (USA)  
OSHA: Occupational Safety and Health Administration (USA)  
NTP: National Toxicology Program (USA)  
IARC: International Agency for Research on Cancer  
EPA: Environmental Protection Agency (USA)  
Ox. Sol. 3: Oxidizing solids – Category 3  
Acute Tox. 4: Acute toxicity – Category 4  
Repr. 1A: Reproductive toxicity – Category 1A  
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2

USA