SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name: Lead

Product Number: 391352
Brand: Aldrich
CAS-No.: 7439-92-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company: Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone: +1 314 771-5765
Fax: +1 800 325-5052

1.4 Emergency telephone

Emergency Phone #: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 1A), H360
Effects on or via lactation, H362
Specific target organ toxicity - repeated exposure, Oral (Category 1), Central nervous system, Blood, Immune system, Kidney, H372
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Aldrich - 391352
Signal word: Danger

Hazard statement(s):  
H351 Suspected of causing cancer.  
H360 May damage fertility or the unborn child.  
H362 May cause harm to breast-fed children.  
H372 Causes damage to organs (Central nervous system, Blood, Immune system, Kidney) through prolonged or repeated exposure if swallowed.  
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s):  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.  
P263 Avoid contact during pregnancy/ while nursing.  
P264 Wash skin thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
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.  
P391 Collect spillage.  
P405 Store locked up.  
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

| Formula | Pb |
| Molecular weight | 207.20 g/mol |
| CAS-No. | 7439-92-1 |
| EC-No. | 231-100-4 |

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Carc. 2; Repr. 1A; Lact.; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H351, H360, H362, H372, H400, H410</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

Concentration limits:  
>= 2.5 %: Repr. 2, H361f; >= 0.5 %: STOT RE 2, H373; >= 0.03 %: Repr. 1A, H360; M-Factor - Aquatic Acute: 10

For the full text of the H-Statements mentioned in this Section, see Section 16.
SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

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

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Nature of decomposition products not known.
Combustible.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet.
SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
No special precautionary measures necessary.

6.3 Methods and materials for containment and cleaning up
Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Storage conditions
Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Storage class
Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Ingredients with workplace control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Remarks</td>
</tr>
<tr>
<td>Lead</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Aldrich - 391352

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Nervous System impairment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hematologic effects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peripheral Nervous System impairment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substances for which there is a Biological Exposure Index or Indices (see BEI® section)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirmed animal carcinogen with unknown relevance to humans</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**TWA 0.05 mg/m³ USA, ACGIH Threshold Limit Values (TLV)**

**Biological occupational exposure limits**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Parameters</th>
<th>Value</th>
<th>Biological specimen</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>Lead</td>
<td>200 µg/l</td>
<td>In blood</td>
<td>ACGIH - Biological Exposure Indices (BEI)</td>
</tr>
</tbody>
</table>

**Remarks** Not critical

### 8.2 Exposure controls

**Appropriate engineering controls**
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

**Personal protective equipment**

**Eye/face protection**
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our

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If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our
customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
protective clothing

**Respiratory protection**
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
No special precautionary measures necessary.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

| a) Appearance | Form: powder |
| b) Odor | No data available |
| c) Odor Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | Melting point/range: 327.4 °C (621.3 °F) - lit. |
| f) Initial boiling point and boiling range | 1,740 °C 3,164 °F - lit. |
| g) Flash point | (Not applicable) |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | No data available |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapor pressure | No data available |
| l) Vapor density | No data available |
| m) Density | 11.45 g/cm³ at 23.8 °C (74.8 °F) at 1,013 hPa - OECD Test Guideline 109 |
| | Relative density | 11.45 at 23.8 °C (74.8 °F) - OECD Test Guideline 109 |
| n) Water solubility | 0.185 g/l at 20 °C (68 °F) at 1,013 hPa - OECD Test Guideline 105 - partly soluble |
| o) Partition coefficient: n-octanol/water | Not applicable for inorganic substances |
| p) Autoignition temperature | No data available |
| q) Decomposition temperature | No data available |
r) Viscosity No data available
s) Explosive properties No data available
t) Oxidizing properties none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Risk of explosion with:
- azides
- picrates
- ammonium nitrate
- Strong oxidizing agents
- Exothermic reaction with:
  - Fluorine
  - hydrogen peroxide
Generates dangerous gases or fumes in contact with:
- Nitric acid

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
- LD50 Oral - Rat - male and female - > 2,000 mg/kg
  (OECD Test Guideline 423)
- LC50 Inhalation - Rat - male and female - 4 h - > 5.05 mg/l
  (OECD Test Guideline 403)
- LD50 Dermal - Rat - male and female - > 2,000 mg/kg
  (OECD Test Guideline 402)

Skin corrosion/irritation
- Skin - Rabbit
  Result: No skin irritation - 4 h
Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation - 72 h

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative

Germ cell mutagenicity
Test Type: Micronucleus test
Species: Rat
Cell type: Red blood cells (erythrocytes)
Application Route: Oral
Result: positive
Remarks: (ECHA)

Test Type: comet assay
Species: Mouse
Cell type: Liver cells
Application Route: Inhalation
Result: negative
Remarks: (ECHA)

Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Oral
Result: Positive results were obtained in some in vivo tests.
Remarks: (ECHA)

Test Type: Chromosome aberration test in vitro
Species: Monkey
Cell type: lymphocyte
Application Route: Oral
Result: Positive results were obtained in some in vivo tests.
Remarks: (ECHA)

Carcinogenicity
IARC: 2B - Group 2B: Possibly carcinogenic to humans (Lead)
NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

Reproductive toxicity
May damage the unborn child. Positive evidence from human epidemiological studies.
May damage fertility. Positive evidence from human epidemiological studies. Studies indicating a hazard to babies during the lactation period

**Specific target organ toxicity - single exposure**
No data available

**Specific target organ toxicity - repeated exposure**
Oral - Causes damage to organs through prolonged or repeated exposure. - Central nervous system, Blood, Immune system, Kidney

**Aspiration hazard**
No data available

### 11.2 Additional Information

RTECS: OF7525000
anemia
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

On the basis of the morphology of the product, no hazardous properties are to be expected when it is handled and used with appropriate care.

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, metallic taste, nausea, vomiting, and colics occur, in many instances followed by shock. Chronic uptake causes peripheral muscular weakness ("drop-wrist"), anaemia, and central-nervous disorders. Women of child-bearing age should not be exposed to the substance over longer periods of time (observe critical threshold).

Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

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### SECTION 12: Ecological information

#### 12.1 Toxicity

**Toxicity to fish**
static test LC50 - Oncorhynchus mykiss (rainbow trout) - 0.1 mg/l - 96 h
Remarks: (ECHA)

**Toxicity to algae**
mortality EC50 - Skeletonema costatum - 7.94 mg/l - 10 d
Remarks: (ECOTOX Database)

**Lead**

#### 12.2 Persistence and degradability

**Biodegradability**
Result: - According to the results of tests of biodegradability this product is not readily biodegradable.
Remarks: The methods for determining biodegradability are not applicable to inorganic substances.
12.3 Bioaccumulative potential
Bioaccumulation Oncorhynchus kisutch - 2 Weeks
- 150 µg/l (Lead)

Bioconcentration factor (BCF): 12

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)
UN number: 3077   Class: 9   Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)
Reportable Quantity (RQ): 10 lbs
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 3077   Class: 9   Packing group: III   EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead)
Marine pollutant: yes

IATA
UN number: 3077   Class: 9   Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

SECTION 15: Regulatory information
**SARA 302 Components**
This material does not contain any components with a section 302 EHS TPQ.

**SARA 313 Components**
The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>2015-11-23</td>
</tr>
</tbody>
</table>

**SARA 311/312 Hazards**
Acute Health Hazard, Chronic Health Hazard

| Reportable Quantity | D008 lbs |

**Massachusetts Right To Know Components**
No components are subject to the Massachusetts Right to Know Act.

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**SECTION 16: Other information**

**Further information**
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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