1 Identification
Product identifier
Product name: Aluminum powder
Stock number: 42919
CAS Number:
7429-90-5
EC number:
231-072-3
Index number:
013-001-00-6

Relevant identified uses of the substance or mixture and uses advised against.
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)

GHS02 Flame
Pyr. Sol. 1 H250 Catches fire spontaneously if exposed to air.
Water-react. 2 H261 In contact with water releases flammable gas.

Hazard pictograms

GHS02

Signal word Danger
Hazard statements
H250 Catches fire spontaneously if exposed to air.
H261 In contact with water releases flammable gas.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P222 Do not allow contact with air.
P331+P332 Handle under inert gas. Protect from moisture.
P337+P373 In case of fire: Use for extinction: Special powder for metal fires.
P422 Store contents under inert gas.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS classification
B6 - Reactive flammable material

Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

Health (acute effects) = 1
Flammability = 3
Physical Hazard = 2

Other hazards

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients
Chemical characterization: Substances
CAS# Description:
7429-90-5 Aluminum
Identification number(s):
EC number: 231-072-3
Index number: 013-001-00-6

4 First-aid measures
Description of first aid measures
After inhalation
In case of unconsciousness place patient stably in side position for transportation.
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
5 Fire-fighting measures

Extinguishing media

Suitable extinguishing agents: Special powder for metal fires. Do not use water.

For safety reasons unsuitable extinguishing agents: Water

Special hazards arising from the substance or mixture

Spontaneously flammable in air.

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

- Aluminum oxide

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.

Keep away from ignition sources.

Environmental precautions:

No special measures required.

Methods and material for containment and cleaning up:

Keep away from ignition sources.

Do not flush with water or aqueous cleansing agents.

Prevention of secondary hazards:

Keep away from ignition sources.

Reference to other sections

See Section 2 for information on safe handling.

See Section 7 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage

Handling

Precautions for safe handling

Handle under dry protective gas.

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Information about protection against explosions and fires:

- Substance/product is self-ignitable.

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:

- Do not store together with acids.
- Store away from oxidizing agents.
- Store away from strong bases.
- Store away from halogenated compounds.
- Store away from air.
- Store away from water/moisture.

Further information about storage conditions:

- Store under dry inert gas.
- This product is moisture sensitive.
- This product is air sensitive.
- Keep container tightly sealed.
- Store in cool, dry conditions in well sealed containers.
- Protect from humidity and water.

Specific end use(s):

- No further relevant information available.

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:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Long-term value (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>15*; 15**</td>
</tr>
<tr>
<td>PEI (USA)</td>
<td>Long-term value: 10*</td>
</tr>
<tr>
<td>REL (USA)</td>
<td>Long-term value: 1*</td>
</tr>
<tr>
<td>TLV (USA)</td>
<td>Long-term value: 1.0</td>
</tr>
<tr>
<td>EL (Canada)</td>
<td>Long-term value: 5</td>
</tr>
<tr>
<td>EV (Canada)</td>
<td>Long-term value: 5</td>
</tr>
</tbody>
</table>

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.
Product name: Aluminum powder
(Contd. of page 2)

38.0.2 Wash hands before breaks and at the end of work. Maintain an ergonomically appropriate working environment.

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) 480
Glove thickness 0.11 mm
Eye protection:
Safety glasses
Full face protection

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information
Appearance:
Form:
Powder
Color:
Silver grey
Odor:
Odorless
Odor threshold:
Not determined.

pH-value:
Not applicable.

Change in condition
Melting point/Melting range:
660.4 °C (1221 °F)
Boiling point/Boiling range:
2519 °C (4566 °F)
Sublimation temperature / start:
Not determined

Flash point:
Not applicable
Flammability (solid, gaseous):
Contact with water liberates extremely flammable gases.
Ignition temperature:
400 °C (752 °F)
Decomposition temperature:
Not determined
Auto igniting:
Spontaneously flammable in air.

Danger of explosion:
Not determined.
Explosion limits:
Lower:
Not determined
Upper:
Not determined

Vapor pressure:
Not applicable.
Density at 20 °C (68 °F):
2.7 g/cm³ (22.532 lbs/gal)
Relative density:
Not determined
Vapor density:
Not applicable.
Evaporation rate:
Not applicable.

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
In contact with water releases flammable gases which may ignite spontaneously. Catches fire spontaneously if exposed to air.

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
Spontaneously flammable in air.
Contact with water releases flammable gases

Conditions to avoid: No further relevant information available.

Incompatible materials:
Acids
Air
Oxidizing agents
Bases
Halocarbons
Water/moisture
Hazardous decomposition products: Aluminum oxide

11 Toxicological information

Information on toxicological effects
Acute toxicity: 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:
IARC A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

Reproductive toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for this substance.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

(Contd. on page 4)
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.

Additional ecological information:
General notes:
Do not allow material to be released to the environment without proper governmental permits.
Do not allow undiluted product or large quantities to reach ground water, water courses or sewage system.
Avoid transfer into the environment.

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
UN1396

UN proper shipping name
DOT
Aluminum powder, uncoated

IMDG, IATA
ALUMINIUM POWDER, UNCOATED

Transport hazard class(es)

DOT

Class
4.3 Substances which, in contact with water, emit flammable gases.

Label
4.3

IMDG, IATA

Class
4.3 Substances which, in contact with water, emit flammable gases.

Label
4.3

Packing group
DOT, IMDG, IATA
II

Environmental hazards: Not applicable.

Special precautions for user
Warning: Substances which, in contact with water, emit flammable gases
EMS Number: F-G-S-Ö

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

Transport/Additional information:
DOT
Marine Pollutant (DOT): No

UN "Model Regulation": UN1396, Aluminum powder, uncoated, 4.3, 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

GHS02

Signal word: Danger

Hazard statements
H225 Catches fire spontaneously if exposed to air.
H281 In contact with water releases flammable gas.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P222 Do not allow contact with air.
P231+P332 Handle under inert gas. Protect from moisture.
P370+P378 In case of fire: Use for extinction: Special powder for metal fires.
P424 Store contents under inert gas.
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)

7429-90-5 Aluminum

(Contd. on page 5)
California Proposition 65
Prop 65 - Chemicals known to cause cancer Substance is not listed.
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. Substance is not listed.
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 Material 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 / last revision 11/23/2015 / -

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 Organization
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
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
EPA: Environmental Protection Agency (USA)