

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.1
Creation Date: July 15, 2019
Revision Date: April 25, 2024

SECTION 1: Identification

1.1 GHS Product identifier

Product name Reference Material for Aluminum Single Element Solution

1.2 Other means of identification

Product number CPRM2139
Other names -

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.
Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.
Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou
Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175
Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Pyrophoric solids, Category 1
Substances and mixtures, which in contact with water, emit flammable gases, Category 2

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H250 Catches fire spontaneously if exposed to air
H261 In contact with water releases flammable gas

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P222 Do not allow contact with air.
P233 Keep container tightly closed.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P223 Do not allow contact with water.
P231+P232 Handle and store contents under inert gas/....Protect from moisture.
P302+P335+P334 IF ON SKIN: Brush off loose particles from skin. Immerse in cool water [or wrap in wet bandages].
P370+P378 In case of fire: Use ... to extinguish.
P402+P404 Store in a dry place. Store in a closed container.
P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Response

Storage

Disposal

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Reference Material for Aluminum Single Element Solution	Aluminium	7429-90-5	231-072-3	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

Rinse skin with plenty of water or shower.

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth.

4.2 Most important symptoms/effects, acute and delayed

Excerpt from ERG Guide 170 [Metals (Powders, Dusts, Shavings, Borings, Turnings, or Cuttings, etc.)]: Oxides from metallic fires are a severe health hazard. Inhalation or contact with substance or decomposition products may cause severe injury or death. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. (ERG, 2016)

Excerpt from ERG Guide 135 [Substances - Spontaneously Combustible]: Fire will produce irritating, corrosive and/or toxic gases.

Inhalation of decomposition products may cause severe injury or death. Contact with substance may cause severe burns to skin and eyes.

Runoff from fire control may cause pollution. (ERG, 2016)

Excerpt from ERG Guide 138 [Substances - Water-Reactive (Emitting Flammable Gases)]: Inhalation or contact with vapors, substance or decomposition products may cause severe injury or death. May produce corrosive solutions on contact with water. Fire will produce irritating, corrosive and/or toxic gases. Runoff from fire control may cause pollution. (ERG, 2016)

Excerpt from ERG Guide 169 [Aluminum (Molten)]: Contact causes severe burns to skin and eyes. Fire may produce irritating and/or toxic gases. (ERG, 2016)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Diagnosis: when history is unattainable, diagnosis depends on the demonstration of large amount of aluminum in vomitus, stomach contents or feces. Aluminum compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Large fires must be isolated and allowed to burn out, but small ones can be controlled by sand, talc, or sodium chloride.

5.2 Specific hazards arising from the chemical

Excerpt from ERG Guide 170 [Metals (Powders, Dusts, Shavings, Borings, Turnings, or Cuttings, etc.)]: May react violently or explosively on contact with water. Some are transported in flammable liquids. May be ignited by friction, heat, sparks or flames. Some of these materials will burn with intense heat. Dusts or fumes may form explosive mixtures in air. Containers may explode when heated. May re-ignite after fire is extinguished. (ERG, 2016)

Excerpt from ERG Guide 135 [Substances - Spontaneously Combustible]: Flammable/combustible material. May ignite on contact with moist air or moisture. May burn rapidly with flare-burning effect. Some react vigorously or explosively on contact with water. Some may decompose explosively when heated or involved in a fire. May re-ignite after fire is extinguished. Runoff may create fire or explosion hazard. Containers may explode when heated. (ERG, 2016)

Excerpt from ERG Guide 138 [Substances - Water-Reactive (Emitting Flammable Gases)]: Produce flammable gases on contact with water. May ignite on contact with water or moist air. Some react vigorously or explosively on contact with water. May be ignited by heat, sparks or flames. May re-ignite after fire is extinguished. Some are transported in highly flammable liquids. Runoff may create fire or explosion hazard. (ERG, 2016)

Excerpt from ERG Guide 169 [Aluminum (Molten)]: Substance is transported in molten form at a temperature above 705°C (1300°F). Violent reaction with water; contact may cause an explosion or may produce a flammable gas. Will ignite combustible materials (wood, paper, oil, debris, etc.). Contact with nitrates or other oxidizers may cause an explosion. Contact with containers or other materials, including cold, wet or dirty tools, may cause an explosion. Contact with concrete will cause spalling and small pops. (ERG, 2016)

5.3 Special protective actions for fire-fighters

Use dry sand, special powder. NO water. NO carbon dioxide, foam.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered dry containers.

6.2 Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered dry containers.

6.3 Methods and materials for containment and cleaning up

Environmental considerations: Water spill: Use natural barriers or oil spill control booms to limit spill travel. Use natural deep water pockets, excavated lagoons, or sand bag barriers to trap material at bottom. Remove trapped material with suction hoses.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO contact with acids, alcohol, oxidizing agents or water. Closed system, dust explosion-proof electrical equipment and lighting. Prevent deposition of dust. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong oxidants, strong bases, strong acids and water. See Chemical Dangers. Dry. Well closed. Store in cool, dry, well-ventilated location. Separate from acids, alkalies, halogenated compounds, oxidizers, combustible materials.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 1 mg/m³, as TWA; A4 (not classifiable as a human carcinogen). MAK: (inhalable fraction): 4 mg/m³; (respirable fraction): 1.5 mg/m³; pregnancy risk group: D

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

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

Eye/face protection

Wear safety goggles.

Skin protection

Protective gloves.

Respiratory protection

Use local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Solid. Malleable, ductile metal; cubic crystal.
Colour	Siliver white.
Odour	Odorless
Melting point/freezing point	Ca. 500 - 600 °C.
Boiling point or initial boiling point and boiling range	Ca. 2 450 - 2 467 °C.
Flammability	Combustible Solid, finely divided dust is easily ignited; may cause explosions.
Lower and upper explosion limit/flammability limit	no data available
Flash point	645°C
Auto-ignition temperature	Remarks: The sample doesn't show a self-ignition behaviour.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	Insoluble (NIOSH, 2016)
Partition coefficient n-octanol/water	no data available
Vapour pressure	0 hPa. Temperature: 974 °C.
Density and/or relative density	2.7. Temperature: 20 °C.
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Reacts with water and alcohols. Reacts violently with oxidants, strong acids, strong bases and chlorinated hydrocarbons. This generates fire and explosion hazard.

10.2 Chemical stability

In moist air, oxide film forms which protects metal from corrosion.

10.3 Possibility of hazardous reactions

Finely divided aluminum dust is easily ignited. Dust explosion possible if in powder or granular form, mixed with air. ALUMINUM POWDER, [COATED] is a reducing agent. Coating moderates or greatly moderates its reactivity compared to the uncoated material. Reacts exothermically if mixed with metal oxides and heated (thermite process). Heating a mixture with copper oxides caused a strong explosion [Mellor 5:217-19 1946-47]. Reacts with metal salts, mercury and mercury compounds, nitrates, sulfates, halogens, and halogenated hydrocarbons to form compounds that are sensitive to mechanical shock [Handling Chemicals Safely, 1980 p. 135]. A mixture with powdered ammonium persulfate and water may explode [NFPA 491M, 1991]. Heating a mixture with bismuth trioxide leads to an explosively violent reaction [Mellor 9:649, 1946-47]. Mixtures with finely divided bromates (also chlorates and iodates) of barium, calcium, magnesium, potassium, sodium or zinc can explode by heat, percussion, and friction, [Mellor 2:310, 1946-47]. Burns in the vapor of carbon disulfide, sulfur dioxide, sulfur dichloride, nitrous oxide, nitric oxide, or nitrogen peroxide [Mellor 5:209-212, 1946-47]. A mixture with carbon tetrachloride exploded when heated to 153° C and also by impact [Chem. Eng. News 32:258, 1954; UL Bull. Research 34, 1945; ASES Pot. Incid. 39, 1968]. Mixing with chlorine trifluoride in the presence of carbon results in a violent reaction [Mellor 2 Supp. 1, 1956]. Ignites in close contact with iodine. Three industrial explosions involving a photoflash composition containing potassium perchlorate with aluminum and magnesium powder have occurred [ACS 146:210, 1945; NFPA 491M 1991]. Reacts with methyl chloride in the presence of small amounts of aluminum chloride to give flammable trimethylaluminum. Gives a detonable mixture with liquid oxygen [NFPA 491M 1991]. The reaction with silver chloride, once started, proceeds with explosive violence [Mellor 3:402 1946-47]. In an industrial accident, the accidental addition of water to a solid mixture of sodium hydrosulfite and powdered aluminum caused the generation of SO₂, heat and more water. The aluminum powder reacted with water and other materials to generate more heat, leading to a deflagration that killed five workers [Case Study, Accident Investigation: Napp Technologies, 14th International Hazardous Material Spills Conference].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

A mixture of aluminum powder and ammonium nitrate can be used as an explosive. A number of explosions in which ammonium nitrate and aluminum are mixed with carbon, hydrocarbons, with or without oxidizing agents, have occurred.

10.6 Hazardous decomposition products

no data available

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: LC50 - rat (male) - > 0.888 mg/L air (analytical).
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

A4: Not classifiable as a human carcinogen. Aluminum metal and insoluble compounds

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

Repeated or prolonged inhalation of dust particles may cause effects on the lungs. The substance may have effects on the nervous system. This may result in impaired functions.

Aspiration hazard

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - Pimephales promelas - 1.16 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: LC50 - Ceriodaphnia dubia - 0.72 mg/L - 48 h.
- Toxicity to algae: NOEC - Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum) - ≥ 0.044 mg/L - 72 h.
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1309 (For reference only, please check.) IMDG: UN1309 (For reference only, please check.) IATA: UN1309 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: ALUMINIUM POWDER, COATED (For reference only, please check.) IMDG: ALUMINIUM POWDER, COATED (For reference only, please check.) IATA: ALUMINIUM POWDER, COATED (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 4.1 (For reference only, please check.) IMDG: 4.1 (For reference only, please check.) IATA: 4.1 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.) IMDG: II (For reference only, please check.) IATA: II (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: No IMDG: No IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

Chemical name	Common names and synonyms	CAS number	EC number
Aluminium	Aluminium	7429-90-5	231-072-3
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.

China Catalog of Hazardous chemicals 2015	Listed.
New Zealand Inventory of Chemicals (NZIoC)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.
Korea Existing Chemicals List (KECL)	Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019
Revision Date April 25, 2024

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

Other UN number: UN1309 Aluminium powder, coated, Hazard class 4.1, Pack group II.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

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