

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0
Creation Date: July 15, 2019
Revision Date: July 15, 2019

SECTION 1: Identification

1.1 GHS Product identifier

Product name Ammonium perchlorate

1.2 Other means of identification

Product number -
Other names azanium perchlorate;

1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.
Uses advised against no data available

1.4 Supplier's details

Company Shanghai Yansheng Internet Technology Co., Ltd
Address 513, A3 / F, green space future center, Fengxian District, Shanghai, 201400, China
Telephone +86-4000-6969-66

1.5 Emergency phone number

Emergency phone number +86-4000-6969-66
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

Explosives, Division 1.1
Oxidizing solids, Category 1

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word Danger
Hazard statement(s) H201 Explosive; mass explosion hazard
H271 May cause fire or explosion; strong oxidizer

Precautionary statement(s)
Prevention P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P230 Keep wetted with ...
P234 Keep only in original packaging.
P240 Ground and bond container and receiving equipment.

Response	<p>P250 Do not subject to grinding/shock/friction/....</p> <p>P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...</p> <p>P220 Keep away from clothing and other combustible materials.</p> <p>P283 Wear fire resistant or flame retardant clothing.</p> <p>P370+P372+P380+P373 In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.</p> <p>P306+P360 IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.</p> <p>P371+P380+P375 In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.</p> <p>P370+P378 In case of fire: Use ... to extinguish.</p>
Storage	<p>P401 Store in accordance with...</p> <p>P420 Store separately.</p>
Disposal	<p>P503 Refer to manufacturer/supplier... for information on disposal/recovery/recycling.</p> <p>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.</p>

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
Ammonium perchlorate	Ammonium perchlorate	7790-98-9	232-235-1	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest.

Following skin contact

First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again.

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. Give one or two glasses of water to drink.

4.2 Most important symptoms/effects, acute and delayed

Irritating to skin and mucous membranes. (USCG, 1999)

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

Basic treatment: Establish a patent airway (oropharyngeal or nasopharyngeal airway, if needed). Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for signs of pulmonary edema and treat if necessary. Monitor for shock and treat if necessary. For eye contamination, flush eyes immediately with water. Irrigate each eye

continuously with 0.9% saline (NS) during transport . Do not use emetics. For ingestion, rinse mouth and administer 5 mg/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool . Do not attempt to neutralize.
Ammonia and related compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

If material on fire or involved in fire: Dangerously explosive. Do not fight fires in a cargo of explosives. Evacuate area and let burn. Explosives

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic gases are produced in a fire. Behavior in Fire: May explode when involved in fire or exposed to shock or friction. (USCG, 1999)

5.3 Special protective actions for fire-fighters

In case of fire in the surroundings, use appropriate extinguishing media. In case of fire: keep drums, etc., cool by spraying with water. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. If appropriate, moisten first to prevent dusting. Sweep spilled substance into covered containers. Then store and dispose of according to local regulations. Do NOT absorb in saw-dust or other combustible absorbents.

6.2 Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. If appropriate, moisten first to prevent dusting. Sweep spilled substance into covered containers. Then store and dispose of according to local regulations. Do NOT absorb in saw-dust or other combustible absorbents.

6.3 Methods and materials for containment and cleaning up

Ion exchange is an ex situ technology used to remove perchlorate from drinking water, groundwater, surface water, and environmental media at full scale. ... The most commonly used ion exchange media are synthetic, strongly basic, anion exchange resins. Ion exchange has been used at sites to reduce perchlorate concentrations to less than 4 ug/L. Its effectiveness is sensitive to a variety of untreated water contaminants and characteristics. It has also been used as a polishing step for other water treatment processes such as biological treatment of perchlorate. Ion exchange of perchlorate in environmental media and drinking water is commercially available. Information is available on 15 full-scale applications, including 11 applications for environmental media, and four applications for drinking water. Three pilot-scale applications for groundwater also have been identified. ...For the 14 groundwater projects (11 full scale and three pilot scale), influent perchlorate concentrations ranged from 10 ug/L to 350,000 ug/L. Effluent concentrations of perchlorate ranged from non-detectable at a detection limit of 0.35 ug/L to 2,000 ug/L. Of the four drinking water projects, performance data were available for only one project. The initial concentration of perchlorate in this project ranged from 20 to 50 ug/L, while the final concentration was below the detection limit of 4 ug/L. ...Cleanup goals varied by site and type of project. Perchlorates

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO contact with combustible substances, reducing agents or organic materials. Do NOT expose to heat, friction or shock. 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

Fireproof. Separated from combustible substances, reducing agents and metals. See Chemical Dangers. Well closed. Separate from acids, alkalis reducing agents, combustible materials. Store in cool, dry, well-ventilated location.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

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 or eye protection in combination with breathing protection if powder.

Skin protection

Protective gloves. Protective clothing.

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. Powder.
Colour	White.
Odour	No odor
Melting point/freezing point	Remarks:Decomposition of pure AP may begin at a temperature higher than 150°C.
Boiling point or initial boiling point and boiling range	no data available
Flammability	Not combustible but enhances combustion of other substances. Many reactions may cause fire or explosion. Gives off irritating or toxic fumes (or gases) in a fire. See Notes.
Lower and upper explosion limit/flammability limit	no data available
Flash point	no data available
Auto-ignition temperature	464° F (USCG, 1999)
Decomposition temperature	>200°C
pH	no data available
Kinematic viscosity	no data available
Solubility	In water, 2.0X10+5 mg/L at 25 deg C
Partition coefficient n-octanol/water	log Pow = -5.84. Temperature:25 °C.
Vapour pressure	< 0 Pa. Remarks:The calculated vapour pressure is 8.3 E-12 Pa at 25°C.

Density and/or relative density	1.95 g/mL. Temperature:20 °C.
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

May decompose on shock, friction, concussion or heating. The substance is a strong oxidant. It reacts violently with combustible and reducing materials and metals. This produces toxic and corrosive fumes including ammonia and hydrogen chloride. This generates fire and explosion hazard.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

IGNITES VIOLENTLY WITH COMBUSTIBLES. AMMONIUM PERCHLORATE is a strong oxidizing agent. Decomposes at 130°C and explodes at 380°C [Mellor 2 Supp. 1:608 1956]. Explosions have occurred in propellant formulations containing ammonium perchlorate to which ferrocene has been added as a burning rate catalyst. Although the cause was not been definitely established, it was most probably frictional heating from dragging a spatula through the mixture [ASESB Expl. Report 211 1966]. Can explode when mixed with sugar, charcoal or on contact with hot copper pipes. Becomes impact-sensitive when contaminated by powdered carbon, ferrocene, sulfur, or other reducing materials such as organic matter or powdered metals.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Ammonium perchlorate decomposes at 130 DEG C and explodes at 380 DEG C

10.6 Hazardous decomposition products

Oxides of nitrogen (except nitrous oxide), hydrogen chloride, and ammonia /are/ emitted on decomposition of ammonium perchlorate...

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD0 - rat (female) - > 2 000 mg/kg bw.
- Inhalation: no data available
- Dermal: LD0 - rat (male/female) - > 2 000 mg/kg bw.

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

no data available

Reproductive toxicity

no data available

STOT-single exposure

The aerosol is irritating to the eyes, skin and respiratory tract.

STOT-repeated exposure

The substance may have effects on the thyroid. This may result in reduced levels of thyroid hormones.

Aspiration hazard

A harmful concentration of airborne particles can be reached quickly when dispersed.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - *Oncorhynchus mykiss* (previous name: *Salmo gairdneri*) - > 200 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - *Daphnia magna* - > 341 mg/L - 48 h.
- Toxicity to algae: EC50 - *Pseudokirchneriella subcapitata* (previous names: *Raphidocelis subcapitata*, *Selenastrum capricornutum*) - > 505 mg/L - 72 h.
- Toxicity to microorganisms: EC50 - activated sludge of a predominantly domestic sewage - > 1 000 mg/L - 3 h. Remarks: Respiration rate.

12.2 Persistence and degradability

ANAEROBIC: Microorganisms isolated from soil have been found to reduce perchlorates under anaerobic conditions using laboratory tests(1). Perchlorate applied to Yolo loam at a concentration of 180 mg/L and incubated anaerobically under flooded conditions was completely biodegraded after 30 days(1). No loss was observed using a Columbia loam soil(1). The facultative anaerobes belonging to the genera *Riemerella*, *Acidovorax* and *Azoarcus* together may be capable of perchlorate reduction(2). However, nitrate does interfere with perchlorate reduction(3). Using sediment and soil samples obtained from two Texas sites associated historically with perchlorate discharge, anaerobic microcosms studies indicate that rapid perchlorate degradation did not occur until nitrate was degraded to a relatively low level(3).

12.3 Bioaccumulative potential

Using a plant-mediated treatment of perchlorate-contaminated water, perchlorate uptake occurred in eastern cottonwoods (*Populus deltoides* and hybrid *populus*), *Eucalyptus cineria*, and willow (*Salix nigra*) in sand bioreactors. Perchlorate uptake in willows was found initially rapid at a rate that was linear with the volume of water evapotranspired by the tree until a plateau was reached. From an initial application of 88.8 mg (96.4 mg/L), the total amounts of perchlorate in root, lower stem, upper stem, and leaf after 26 days were 0.04, 0.18, 0.34 and 0.48 mg, respectively. 11% of the perchlorate was not accounted for and believed to be degraded in the leaves(1).

12.4 Mobility in soil

Ammonium perchlorate readily dissolves and dissociates to the perchlorate ion(1). The perchlorate ion is only weakly absorbed to mineral surfaces of moderate ionic strength(1). The ion exhibits high aqueous solubility and together these properties contribute to its ability to readily migrate in groundwater systems(2).

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: UN0402 (For reference only, please check.) IMDG: UN0402 (For reference only, please check.) IATA: UN0402 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: AMMONIUM PERCHLORATE† (For reference only, please check.) IMDG: AMMONIUM PERCHLORATE† (For reference only, please check.) IATA: AMMONIUM PERCHLORATE† (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 1.1D (For reference only, please check.) IMDG: 1.1D (For reference only, please check.) IATA: 1.1D (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: (For reference only, please check.) IMDG: (For reference only, please check.) IATA: (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
Ammonium perchlorate	Ammonium perchlorate	7790-98-9	232-235-1
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			Not 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 July 15, 2019

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

Different decomposition temperatures are given in the literature, and the unstabilized substance may explode on heating. Health effects of exposure to the substance have not been investigated adequately. Rinse contaminated clothing with plenty of water because of fire hazard.

Any questions regarding this SDS, Please send your inquiry to sds@xixisys.com

Disclaimer: 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. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.