

## Chemical Safety Data Sheet MSDS / SDS

## Ammonium perchlorate SDS

Revision Date:2024-04-25 Revision Number:1

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

Product name: Ammonium perchlorate

CAS: 7790-98-9

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

Relevant identified uses: For R&amp;D use only. Not for medicinal, household or other use.

Uses advised against: none

**Company Identification**

Company: Chemicalbook.in

Address: 5 vasavi Layout Basaveswara Nilayam Pragathi Nagar Hyderabad, India -500090

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**SECTION 2: Hazards identification****Classification of the substance or mixture**Explosives, Division 1.1  
Oxidizing solids, Category 1

## 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.

P250 Do not subject to grinding/shock/friction/....

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

P220 Keep away from clothing and other combustible materials.

P283 Wear fire resistant or flame retardant clothing.

#### Response

P370+P372+P380+P373 In case of fire: Explosion risk. Evacuate area. DO NOT fight fire when fire reaches explosives.

P306+P360 IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

P371+P380+P375 In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

P370+P378 In case of fire: Use ... to extinguish.

#### Storage

P401 Store in accordance with...

P420 Store separately.

#### Disposal

P503 Refer to manufacturer/supplier... for information on disposal/recovery/recycling.

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.

#### Other hazards which do not result in classification

no data available

### SECTION 3: Composition/information on ingredients

#### Substance

Chemical name:	Ammonium perchlorate
Common names and synonyms:	Ammonium perchlorate
CAS number:	7790-98-9
EC number:	232-235-1
Concentration:	100%

### SECTION 4: First aid measures

#### 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.

##### Most important symptoms/effects, acute and delayed

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

### **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: Firefighting measures**

### **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

### **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)

### **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**

### **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.

### **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.

#### **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**

#### **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.

#### **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**

#### **Control parameters**

#### **Occupational Exposure limit values**

no data available

**Biological limit values**

no data available

**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.

**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

### 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.

### **Chemical stability**

no data available

### **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.

### **Conditions to avoid**

no data available

### **Incompatible materials**

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

### **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****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.

### **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).

### **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).

### **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).

### **Other adverse effects**

no data available

## **SECTION 13: Disposal considerations**

### **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**

### **UN Number**

ADR/RID: UN0402 (For reference only, please check.)

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

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

### **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.)

### **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.)

### **Packing group, if applicable**

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

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

### **Environmental hazards**

ADR/RID: No

IMDG: No

IATA: No

**Special precautions for user**

no data available

**Transport in bulk according to IMO instruments**

no data available

**SECTION 15: Regulatory information**

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

**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.

**(PICCS)**

Listed.

**Vietnam National Chemical Inventory**

Not Listed.

**IECSC)**

Listed.

## Korea Existing Chemicals List (KECL)

Listed.

### SECTION 16: Other information

#### 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](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.

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