Chemical Safety Data Sheet MSDS / SDS

Potassium chlorate SDS

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

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

Product identifier

Product name: Potassium chlorate

CAS: 3811-04-9

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

Relevant identified uses: For R&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

Telephone: +91 9550333722

SECTION 2: Hazards identification

Classification of the substance or mixture

Oxidizing solids, Category 1
Acute toxicity - Category 4, Oral

Acute toxicity - Category 4, Inhalation
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 2

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H271 May cause fire or explosion; strong oxidizer
H302 Harmful if swallowed
H332 Harmful if inhaled
H411 Toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P220 Keep away from clothing and other combustible materials.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P283 Wear fire resistant or flame retardant clothing.
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.

Response

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.
P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P317 Get medical help.
P391 Collect spillage.

Storage

P420 Store separately.

Disposal

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:	Potassium chlorate
Common names and synonyms:	Potassium chlorate
CAS number:	3811-04-9
EC number:	223-289-7
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

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

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. Refer immediately for medical attention.

Most important symptoms/effects, acute and delayed

Inhalation of dust can irritate nose and throat. Contact with eyes or skin causes irritation. Ingestion causes abdominal pain, nausea, vomiting, cyanosis, collapse. (USCG, 1999)
Excerpt from ERG Guide 140 [Oxidizers]: Inhalation, ingestion or contact (skin, eyes) with vapors or substance may cause severe injury, burns or death. Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. (ERG, 2016)

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

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Chlorates and Related Compounds

SECTION 5: Firefighting measures

Suitable extinguishing media

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. When heated, it releases oxygen which increases combustion. Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic fumes are formed in fires. Behavior in Fire: Decomposes when hot to form oxygen, which increases severity of fire. (USCG, 1999)
Excerpt from ERG Guide 140 [Oxidizers]: These substances will accelerate burning when involved in a fire. Some may decompose explosively when heated or involved in a fire. May explode from heat or contamination. Some will react explosively with hydrocarbons (fuels). May ignite combustibles (wood, paper, oil, clothing, etc.). Containers may explode when heated. Runoff may create fire or explosion hazard. (ERG, 2016)

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

Consult an expert! Sweep spilled substance into covered sealable containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water. Do NOT absorb in saw-dust or other combustible absorbents.

Environmental precautions

Consult an expert! Sweep spilled substance into covered sealable containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water. Do NOT absorb in saw-dust or other combustible absorbents.

Methods and materials for containment and cleaning up

Accidental Release Measures. Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames. NO contact with flammables. NO contact with hot surfaces. Do NOT expose to 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

Separated from combustible substances, reducing agents, strong acids, organic chemicals, ammonium compounds, powdered metals and food and feedstuffs. Dry.... Containers of potassium chlorate should be protected from physical damage and sudden shocks.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	Potassium chlorate			
CAS No.	3811-04-9			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m^3	ppm	mg/m^3
Latvia	?	5	?	?
	Remarks			

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.

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:	Potassium chlorate is a white crystalline solid. Forms a very flammable mixture with combustible materials. Mixture may be explosive if combustible material is very finely divided. Mixture may be ignited by friction. Contact with strong sulfuric acid may cause fires or explosions. May spontaneously decompose and ignite when mixed with ammonium salts. May explode under prolonged exposure to heat or fire. Used to make matches, paper, explosives, and many other uses.
Colour:	Colorless, lustrous crystals or white granules or powder
Odour:	no data available
Melting point/freezing point:	356-368°C
Boiling point or initial boiling point and boiling range:	400°C
Flammability:	Not combustible but enhances combustion of other substances. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	no data available
Auto-ignition temperature:	no data available
Decomposition temperature:	400°C
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	8.61 g/100 g water at 25 deg C
Partition coefficient n-octanol/water:	no data available
Vapour pressure:	no data available

Density and/or relative density:	2.32
Relative vapour density:	no data available
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Decomposes above 400°C . Decomposes on contact with strong acids. This produces oxygen and toxic fumes including chlorine dioxide and chlorine. The substance is a strong oxidant. It reacts violently with combustible and reducing materials. This generates fire and explosion hazard. Attacks many metals in the presence of water.

Chemical stability

Stable under ordinary conditions of use and storage.

Possibility of hazardous reactions

Not flammable, but may cause fire upon contact with ordinary combustibles.Metal chlorates are oxidants in the presence of strong acid; liberates explosive chlorine dioxide gas; liberates chlorine dioxide and carbon dioxide by heating a moist metal chlorate and a dibasic organic acid; mixtures of perchlorates with sulfur or phosphorus are explosives [Bretherick 1979 p. 100]; mixtures of the chlorate with ammonium salts, powdered metals, silicon, sulfur, or sulfides are readily ignited and potentially explosive [Bretherick 1979 p. 806]. A combination of finely divided aluminum with finely divided bromates (also chlorates and iodates) of barium, calcium, magnesium, potassium, sodium, or zinc can explode by heat, percussion, or friction [Mellor 2:310. 1946-47]. An explosion occurred during heating of a mixture of potassium chlorate and magnesium [Chem. Eng. News 14:451. 1936]. Gaseous ammonia, mixed with air reacts so vigorously with potassium chlorate that the reaction could become dangerous [Mellor 8:217. 1946-47]. A mixture of potassium chlorate and sodium amide explodes [Mellor 8:258. 1946-47]. If a drop of a solution of sulfur dioxide in ether or alcohol is added to powdered potassium chlorate, the mass explodes [Mellor 2:311. 1946-47]. Potassium chlorate and sulfuric acid react to cause fire and possible explosions [Mellor 2:315. 1946-47].

Conditions to avoid

no data available

Incompatible materials

Violent reaction or ignition with ... ammonium salts, ammonium sulfate, Sb_2S_3, arsenic, barium hypophosphite, BaS, calcium hypophosphite, CaS, charcoal, Cu_3P_2, fabrices, ... lactose, (Mg + $CuSO_4$ (anhydrous) + NH_4NO_3 + water), MnO_2, dinickel trioxide, dibasic organic acids, organic matter, $NaNH_2$, sugar + sulfuric acid, sucrose, SO_2, sulfuric acid, thiocyanates, thorium dicarbide, sodium amide, KOH, metal hypophosphites.

Hazardous decomposition products

Decomposes on heating above 400 deg C, on contact with strong acids producing toxic fumes including chlorine dioxide, chlorine fumes and producing oxygen.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat oral 1870 mg/kg bw

Inhalation: no data available

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

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the respiratory tract. The substance may cause effects on the blood and kidneys. This may result in haemolysis, the formation of methaemoglobin and kidney impairment. The effects may be delayed. Medical observation is indicated.

STOT-repeated exposure

The substance may have effects on the blood. This may result in the formation of methaemoglobin.

Aspiration hazard

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

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: LC50; Species: Daphnia magna (Water flea, age < or =24 hr); Conditions: freshwater, static, 20-22 deg C, pH 7.6-7.7; Concentration: 880 mg/L for 24 hr

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

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: UN1485 (For reference only, please check.)
IMDG: UN1485 (For reference only, please check.)
IATA: UN1485 (For reference only, please check.)

UN Proper Shipping Name

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

Transport hazard class(es)

ADR/RID: 5.1 (For reference only, please check.)
IMDG: 5.1 (For reference only, please check.)
IATA: 5.1 (For reference only, please check.)

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.)

Environmental hazards

ADR/RID: Yes
IMDG: Yes
IATA: Yes

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

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

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

Will turn shock-sensitive if contaminated with organic substances, reducing materials, metal powders and ammonium compounds. Depending on the degree of exposure, periodic medical examination is suggested. Specific treatment is necessary in case of poisoning with this substance; the appropriate means with instructions must be available. Rinse contaminated clothing with plenty of water because of fire hazard.