

Potassium Amyl Xanthate:

MATERIAL SAFETY DATA SHEET



SINORAN MINING&METALLURGY EQUIPMENT CO., LTD

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Company Name: **SINORAN MINING&METALLURGY EQUIPMENT CO.,LTD.**

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PRODUCT IDENTIFICATION:

Product Name: Potassium Amyl Xanthate, Solid.

Date of Revision: 2009 June 17

Effective Date:

HCI0065/09B

Chemical Name: Dithiocarbonic Acid, Amyl Ester, Potassium Salt.

Synonyms: Potassium Amyl Xanthate; KAX 51; Potassium Pentyl Xanthate; Potassium Pentyl Xanthogenate.

Chemical Family: Salts of carbonic acid dithio esters.

Molecular Formula: C₆H₁₁OS₂. K.

Product Use: Flotation agent.

2. COMPOSITION, INFORMATION ON INGREDIENTS(Not Intended As Specifications)

<i>Ingredient</i>	<i>CAS# ACGIH</i>	<i>TLV %</i>	<i>Concentration</i>
Potassium Amyl Xanthate	2720-73-2	----	60 - 100
Potassium Hydroxide	1310-58-3	----	1 - 5
Isoamyl alcohol	123-51-3	100 ppm	1 - 5
Decomposition Product:	75-15-0	10 ppm (Skin)	

Carbon disulfide

Skin Notation: Contact with skin, eyes and mucous membranes can contribute to the overall exposure and may invalidate the TLV. Consider measures to prevent absorption by these routes.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

May be fatal if swallowed. Harmful if inhaled. Causes skin and eye irritation. Dust is irritating to respiratory tract. See "Other Health Effects" Section. Heating of solid xanthate or aging or heating of solutions will cause formation of Carbon Bisulfide. Upon exposure of solid xanthates to moisture and/or heat, decomposition results and spontaneous combustion can occur. Contact of solid xanthate with moist air has resulted in ignition. (4) Emits a flammable gas upon contact with water or water vapour.

Can decompose at high temperatures forming toxic gases. Powdered material may form explosive dust-air mixtures. Contents may develop pressure on prolonged exposure to heat.

POTENTIAL HEALTH EFFECTS

Inhalation: Excessive contact with powder may cause drying of mucous membranes of nose and throat due to absorption of moisture and oils. Product may cause severe irritation of the nose, throat and respiratory tract. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary oedema (fluid build-up in lungs), and reduction of pulmonary function. Irritation of mucous membranes and respiratory tract is possible following exposure to the decomposition product. (3) See "Other Health Effects" Section.

Skin Contact: Brief contact with the dust causes irritation. Greater exposure causes severe burns. In the presence of moisture (perspiration, humidity, tears), the dust dissolves to form a corrosive solution which may cause burns. (3) Potassium Amyl Xanthate may cause symptoms of skin irritation such as reddening, swelling, rash, scaling, or blistering. May cause defatting, drying and cracking of the skin.

Skin absorption: May be absorbed through intact skin. See Section 11, "Other Studies Relevant to Material".

Eye contact: This product may cause irritation, redness and possible damage due to abrasiveness. Brief contact with the dust causes irritation. Greater exposure causes severe burns. In the presence of moisture (perspiration, humidity, tears), the dust dissolves to form a corrosive solution which may cause burns. (3) Irritation of the eyes is possible following exposure to the decomposition product.

Ingestion: Ingestion is not a likely route of exposure. This product causes irritation, a burning sensation of the mouth and throat and abdominal pain.

Other Health Effects: Effects (irritancy) on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential. May cause cardiovascular effects, liver damage, peripheral nervous system (PNS) effects or central nervous system (CNS) depression. CNS depression is characterized by headache, dizziness, drowsiness, nausea, vomiting and incoordination. Severe overexposures may lead to coma and possible death due to respiratory failure. Peripheral Neuropathy is a progressive disorder of the nervous system characterized by sensory and motor abnormalities, muscle spasms, weakness and pain in the arms and legs, numbness and tingling of the fingers and toes and paralysis. Liver damage is characterized by the loss of appetite, jaundice (yellowish skin colour), and occasional pain in the upper left-hand side of the abdomen.

Potassium Amyl Xanthate: Symptoms of potassium poisoning may occur. These include slow heartbeat, accelerated breathing, muscle weakness and, in severe cases, paralysis.

Vapours of the decomposition products of Xanthates (Carbon Bisulphide) can cause severe disturbances of mood and behaviour, including excitation, anger and violent dreams. High concentrations of vapours can cause death.

Carbon Bisulphide: Contact with moisture in the body by inhalation may yield sodium hydroxide (corrosive) and 2-mercaptobenzothiazole, an irritant. (4) Contact with acids will liberate carbon disulphide. (3) Exposure to carbon disulphide (500 to 1000 ppm) may cause severe mood and personality disturbances, including excitability, confusion, irritability, uncontrollable anger, bizarre dreams, insomnia, psychosis and suicide. Exposure to carbon disulphide at 4800 ppm for thirty minutes results in coma and may be fatal. Carbon disulphide is readily absorbed through intact skin. Chronic exposure to carbon disulphide produces central and peripheral nervous system, cardiovascular, gastrointestinal, kidney, endocrine and eye disorders. (4)

Potassium Hydroxide: Exposure to very low doses, even for a short period of time, has produced extensive damage to the esophagus, stomach and intestine extending into surrounding tissues, as well as hyperexcitability followed by apathy and weakness. In some cases, death has resulted from

hemorrhage, adhesions or perforation. Following esophageal damage, strictures have frequently developed in surviving animals.

4. FIRST AID MEASURES

FIRST AID PROCEDURES

Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical advice IMMEDIATELY.

Skin Contact: Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of soap and water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Immerse the exposed part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible. Cover the exposed part with a clean, preferably sterile, lint-free dressing. Obtain medical attention IMMEDIATELY and monitor breathing and treat for shock for severe exposure.

Eye Contact: Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY.

Ingestion: Do not attempt to give anything by mouth to an unconscious person. If victim is alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. IMMEDIATELY contact local Poison Control Centre. Vomiting should only be induced under the direction of a physician or a poison control centre. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

Note to Physicians: Treat symptomatically. Medical conditions that may be aggravated by exposure to this product include neurological and cardiovascular disorders, diseases of the skin, eyes or respiratory tract, preexisting liver and kidney disorders.

5. FIRE-FIGHTING MEASURES

Flashpoint (°C)

Auto-Ignition Temperature (°C)

Flammability Limits in Air (%):

LEL

UEL

-30. (Carbon Disulphide)

90.1 (Carbon Disulphide)

1.25. (Carbon Disulphide)

50. (Carbon Disulphide)

Flammability Class (WHMIS): B-6: Reactive Flammable Material

Hazardous Combustion Products: Thermal decomposition products are toxic and may include Carbon Disulphide, Potassium sulphide carbonyl sulphide, Amyl Alcohols, oxides of carbon, sulphur, potassium and irritating gases.

Unusual Fire or Explosion Hazards: This product may be capable of forming flammable dust clouds in air. Avoid accumulation and dispersion of dust to reduce explosion potential. Spilled material may cause floors and contact surfaces to become slippery. Heating of solid xanthate or aging or heating of solutions will cause formation of Carbon Bisulfide. Upon exposure of solid xanthates to moisture and/or heat, decomposition results and spontaneous combustion can occur. Contact of solid xanthate with moist air has resulted in ignition. Vapours from this product are heavier than air, and may "travel" to a source of ignition (eg. pilot lights, heaters, electric motors) some distance away, and then "flash back" to the point of product discharge causing an explosion and fire. Enforce NO SMOKING rules.

Sensitivity to Mechanical Impact: Not expected to be sensitive to mechanical impact.

Rate of Burning: Not available.

Explosive Power: Not available.

Sensitivity to Static Discharge: If product has come into contact with moisture and Carbon Bisulphide gas has evolved, then Carbon Bisulphide is expected to be sensitive to static discharge if vapours are present between the lower and upper explosive limits. (3) High voltage static electricity build-up is possible when significant quantities of dust are present.

EXTINGUISHING MEDIA

Fire Extinguishing Media: Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog. Cool containers with flooding quantities of water until well after the fire is out. Exposure to heat and moisture may cause the decomposition of xanthates to release flammable, explosive and poisonous Carbon Bisulphide vapours.

FIRE FIGHTING INSTRUCTIONS

Instructions to the Fire Fighters: Use water spray to cool fire-exposed containers or structures. Use water spray to disperse vapours; reignition is possible. Clean up immediately to eliminate slipping hazard. Do not allow to enter sewers or watercourses. Avoid accumulation and dispersion of dust to reduce explosion potential.

Fire Fighting Protective Equipment:: Use self-contained breathing apparatus and protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent or minimize the adverse effects on persons,

property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.

Containment and Clean-Up Procedures: In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. Avoid accumulation and dispersion of dust to reduce explosion potential. Wear respirator, protective clothing and gloves. Spilled material may cause floors and contact surfaces to become slippery.

Anyrecovered product can be used for the usual purpose, depending on the extent and kind of contamination. Where a package (drum or bag) is damaged and / or leaking, repair it, or place it into an over-pack drum immediately so as to avoid or minimize material loss and contamination of surrounding environment. Replace damaged containers immediately to avoid loss of material and contamination of surrounding atmosphere. Avoid dry sweeping. Do not use compressed air to clean surfaces. Vacuuming or wet sweeping is preferred. Return all material possible to container for proper disposal. Do not flush with water as aqueous solutions or powders that become wet render surfaces extremelyslippery. Eliminate all sources of ignition. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment.

7. HANDLING AND STORAGE

HANDLING

Handling Practices: Avoid accumulation and dispersion of dust to reduce explosion potential. Ground and bond equipment

and containers to prevent a static charge buildup. Use spark-resistant tools. Use normal "good" industrial hygiene and housekeeping practices. Clean up immediately to eliminate slipping hazard. Enforce NO SMOKING rules in area of use.

Ventilation Requirements: See Section 8, "Engineering Controls".

Other Precautions: Use only with adequate ventilation and avoid breathing dusts (aerosols, vapours or mists). Avoid

contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Do not use cutting or welding torches on empty drums that contained this material/product. Absorption via contact with skin, eyes and mucous membranes can contribute to the overall exposure. Consider measures to prevent absorption by these routes.

STORAGE

Storage Temperature (°C): See below.

Ventilation Requirements: Ventilation should be explosion proof.

Storage Requirements: Store solid Xanthates under cool, dark, dry conditions. Liquid products must be kept cool and used as

quickly as possible. Store in a cool, well-ventilated area. Keep away from heat, sparks and flames.

Keep containers closed. Do not expose sealed containers to temperatures above 40° C. Avoid moisture contamination. Prolonged storage may result in lumping or caking.

Special Materials to be Used for Packaging or Containers: Materials of construction for storing the product include: carbon steel. Copper and its alloys should not be used in equipment for storage, handling or transportation. Attacks some types of rubber, plastics and coatings. Confirm suitability of any material before using.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

ENGINEERING CONTROLS.

Engineering Controls: Local exhaust ventilation required. Ventilation should be explosion proof. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Avoid accumulation and dispersion of dust to reduce explosion potential. Ventilate low lying areas such as sumps or pits where dense dust may collect.

Enforce NO SMOKING rules.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye Protection: Use chemical safety goggles when there is potential for eye contact. Use full face-shield and chemical safety goggles when there is potential for contact.

Skin Protection: Gloves and protective clothing made from neoprene, PVC, polyethylene, rubber or plastic should be impervious under conditions of use. Attacks some types of rubber, plastics and coatings. Prior to use, user should confirm impermeability. Discard contaminated gloves.

Respiratory Protection: No specific guidelines available. A NIOSH/MSHA-approved air-purifying respirator equipped with dust,

mist, fume cartridges for concentrations up to 2 mg/m³ Potassium Hydroxide. An air-supplied respirator if concentrations are higher or unknown.

Other Personal Protective Equipment: Avoid accumulation and dispersion of dust to reduce explosion potential. Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact. Clothing and footwear that is fire retardant and dissipates static electrical charges should be worn when handling flammable materials. Natural fibers (cotton, wool leather and linen) should be selected in favour of synthetic materials (rayon, nylon and polyester).

Skin Notation: Contact with skin, eyes and mucous membranes can contribute to the overall exposure and may invalidate the TLV. Consider measures to prevent absorption by these routes.

EXPOSURE GUIDELINES

SUBSTANCE	ACGIH TLV	OSHA PEL	NIOSH REL
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	(STEL)	(TWA)	(STEL)	(TWA)	(STEL)
Potassium Hydroxide	2mg/m ³ (ceiling)	-	-	-	2mg/m ³ (ceiling)
Isoamyl alcohol	125ppm	100ppm	-	100ppm	125ppm
Decomposition Product	-	20ppm(skin)	30pm(skin)	1ppm(skin)	3ppm(skin)

9. PHYSICAL AND CHEMICAL PROPERTIES(Not Intended As Specifications)

Physical State: Solid.

Appearance: Yellow to yellow-green pellets.

Odour: Strong, disagreeable sulphur odour.

Odour Threshold (ppm): 0.02 - 0.21(Carbon Disulphide)

Boiling Range (°C): Not available.

Melting/Freezing Point (°C): 255 - 280 (decomposes).

Vapour Pressure (mm Hg at 20° C): Not applicable.

Vapour Density (Air = 1.0): Not applicable.

Relative Density (g/cc):0.7

Bulk Density: Not applicable.

Viscosity: Not applicable.

Evaporation Rate (Butyl Acetate = 1.0): Not applicable.

Solubility: Soluble in water. Hygroscopic(readily absorbs water).

% Volatile by Volume:<20

pH:10.5(10% solution).

Coefficient of Water/Oil Distribution: Not applicable.

Volatile Organic Compounds (VOC): Not applicable.

Flashpoint(°C): -30.(Carbon Disulphide)

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions: Unstable. Solid Xanthates are stable when kept cool and dry. Exposure to heat causes decomposition. Acids and oxidizing agents accelerate aging. In solution, Xanthates will decompose slowly even at room temperature.

Under Fire Conditions: Flammable. This product may be capable of forming flammable dust clouds in air.

Hazardous Polymerization: Will not occur.

Conditions to Avoid: High temperatures, sparks, open flames and all other sources of ignition. Avoid accumulation and dispersion of dust to reduce explosion potential. Exposure to heat and moisture may cause the decomposition of xanthates to release flammable, explosive and poisonous Carbon Bisulphide vapours.

Materials to Avoid: Strong oxidizers. Lewis or mineral acids. Metal Salts. Copper and its alloys.. Contact with acids will liberate Carbon Bisulphide. Avoid moisture contamination. Contact with water or moisture will liberate

Carbon Bisulphide. Mixtures or reactions of alcohols with the following materials may cause explosions: barium perchlorate, chlorine, hypochlorous acid, ethylene oxide, hexamethylene diisocyanate and other isocyanates, nitrogen tetroxide, permonosulfuric acid and tri-isobutyl aluminum. Attacks some types of rubber, plastics and coatings.

Decomposition or Combustion Products: Thermal decomposition products are toxic and may include Carbon Bisulphide, Potassium sulphide, carbonyl sulphide, Amyl Alcohols, oxides of carbon, sulphur, potassium and irritating

gases.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	LD50(Oral, Rat)	LD50(Dermal, Rabbit)	LC(inhalation, Rat, 4h)
Potassium Amyl Xanthate	1000mg/kg(3)	-	-
Potassium Hydroxide	214-365mg/kg(1,3)	1260mg/kg(3)	-
Isoamyl alcohol	1300mg/kg(1)	3216mg/kg(1)	-
Decomposition Product	1200 mg/kg	-	12500mg/kg(1)

Carcinogenicity Data: The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP.

Reproductive Data: This product: No adverse reproductive effects are anticipated.

Mutagenicity Data: No adverse mutagenic effects are anticipated.

Teratogenicity Data: No adverse teratogenic effects are anticipated.

Respiratory / Skin Sensitization Date: None known.

Synergistic Materials: Alcohols may interact synergistically with chlorinated solvents (example - carbon tetrachloride, chloroform, bromotrichloromethane), dithiocarbamates (example - disulfiram), dimethylnitrosamine and thioacetamide.

Carbon Bisulphide: The toxic effects of Carbon Bisulphide, particularly on the nervous system, can be intensified by consumption of alcohol, alcoholism, treatment with disulfiram (Antibuse), and exposure to Hydrogen Sulphide. (4) In animal studies the toxicity of Carbon Bisulphide was intensified by chemicals such as resperine and amphetamine which act on the nervous system.

Other Studies Relevant to Material: None known.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not available. May be harmful to aquatic life.

Environmental Fate: Not available. Product has an unaesthetic appearance and can be a nuisance. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals: Not available.

Waste Disposal Methods: This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.

Safe Handling of Residues: See "Waste Disposal Methods".

Disposal of Packaging: Empty containers retain product residue and can be dangerous. Treat package in the same manner as the product.

14. TRANSPORTATION INFORMATION

XANTHATES, Class 4.2, UN3342, PG III.

Label(s): Spontaneously Combustible. Placard: Spontaneously Combustible.

CERCLA-RQ: Not available. Exemptions: None known.

15. REGULATORY INFORMATION

USA

Environmental Protection Act: All constituents of this product are included on the TSCA inventory.

OSHA HCS (29CFR 1910.1200): Flammable Solid. Toxic. Skin and Eye Irritant.

NFPA: : 3 Health, 4 Fire, 0 Reactivity (6)

HMIS: : Health, Fire, Reactivity (Not available.)

INTERNATIONAL

Not available.

16. OTHER INFORMATION

REFERENCES

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd ed., Vol. IIA,B,C, John Wiley and Sons, New York, 1981.
3. Supplier's Material Safety Data Sheet(s).
4. CHEMINFO, through "CCINFOdisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
5. Guide to Occupational Exposure Values, 2007, American Conference of Governmental Industrial Hygienists, Cincinnati, 2007.
6. Regulatory Affairs Group, Brenntag Canada Inc.
7. The British Columbia Drug and Poison Information Centre, Poison Managements Manual, Canadian Pharmaceutical Association, Ottawa, 1981.

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