

School Material Safety Data Sheet

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POTASSIUM CYANIDE

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SECTION 1. INTRODUCTORY INFORMATION

MATERIAL NAME AND FORMULA: POTASSIUM CYANIDE; KCN

SYNONYMS: Cyanide of Potassium, Potassium Salt of Hydrocyanic Acid

CAS NUMBER: 0151-50-8

INGREDIENTS: Potassium Cyanide (KCN), >95%

DOT CLASSIFICATION: Poison B

EPA CLASSIFICATION: Hazardous Substance, Hazardous Waste Constituent, Priority Toxic Pollutant.

MANUFACTURERS: Always request Material Safety Data Sheets from your chemical supplier. These should indicate the manufacturer of the substance and include an emergency phone number to call. The Manufacturers section of this book contains a listing of some of the larger manufacturers and available emergency numbers.



DESCRIPTION: A white crystalline solid; granular powder or fused pieces. Dry, no odor; moist, possible bitter-almond (HCN) odor.

PRELIMINARY INFORMATION: Potassium cyanide is a violent poison. Can enter body by ingestion, absorption through injured skin, or inhalation of HCN gas produced by reaction with CO₂ or acids. Strong solutions are corrosive to skin. Not combustible but can be hazardous in a fire situation (see sect. 6). Most common area of use would be in the chemistry lab (analytical chemistry reagent). This material should not be used in schools if alternatives can be found to meet the necessary educational objectives. If its use is deemed necessary, keep amounts used to a minimum and use with great caution.

SECTION 2. USE AND STORAGE INFORMATION

— PRELIMINARY PLANNING CONSIDERATIONS —

- The following information is provided even though this material is NOT RECOMMENDED for use in schools. Whenever possible, substitute less hazardous materials.
- Strict safety precautions must be observed at all times when working with this material.
- Safety glasses or goggles and protective clothing (rubberized apron, etc.) should be worn for all experiments.
- Be sure eyewash station and safety shower are in good working order and readily available.
- Always provide for safe disposal of all chemical waste generated in the lab. Check applicable regulations prior to use.
- Provide adequate ventilation or restrict use to fume hood.
- Review sections 3, 5 and 6 to prepare for possible accidents or emergencies.
- Rubber gloves are recommended when working with this material.
- Ensure cyanide antidote kit has reagents within their shelf life date.

— USAGE PRECAUTIONS AND PROCEDURES —

- For safety, contact lenses should not be worn in the laboratory; soft lenses may absorb irritants and all lenses may concentrate them. Particles can also adhere to contact lenses and cause corneal damage.
- READ THE LABEL and follow all precautions.
- Maintain good housekeeping practices to avoid unintentional mixing with incompatible materials.
- After working with this material, always wash hands and face thoroughly before eating, drinking, or smoking.
- No smoking in storage or use area.
- Keep away from strong oxidizing agents and sources of heat or ignition.
- Avoid creating airborne dust conditions. Do not breathe dust or mists. Avoid all contact with skin, eyes, or clothing.
- DO NOT INGEST!
- Do not allow acids to contact potassium cyanide.
- Aqueous solutions are strongly alkaline.

— ADDITIONAL INFORMATION —

- Material does not polymerize. This material is stable at room temperature under normal conditions.
- Incompatible with acids (liberates toxic HCN gas), oxidizing agents, iodine, metallic salts, permanganates, chlorates, peroxides.
- Chlorates, nitrites, and nitrogen trichloride plus ammonia have been found to form explosive mixtures (some spontaneous) when contacted with KCN.
- KCN is deliquescent. It is gradually decomposed on exposure to air by reaction with CO₂ and moisture.

— PREFERRED STORAGE LOCATION AND METHODS —

- Storage area should be cool and well ventilated. Containers should be tightly closed.
- Do not store chemicals alphabetically by name; store by chemical family instead to keep compatibles together.
- All chemical containers should be protected from physical damage and kept out of direct sunlight.
- Smoking should not be permitted in areas where chemicals are stored.
- Purchase only amounts equivalent to one year's needs, if at all.
- Should be stored in approved, locked POISONS cabinet away from acids, oxidizing agents, or other incompatibles.
- Not recommended for use or storage in schools without an absolute need being determined.
- Keep KCN bottle inside another container (plastic bag, metal, can, etc.) for extra safety.

SECTION 3. SPILLS AND DISPOSAL PROCEDURES

IF MATERIAL IS SPILLED:

- Evacuate unnecessary personnel. Ventilate area of spill. Avoid creating airborne dust conditions.
- Cleanup methods such as vacuuming (with appropriate filter) or wet mopping will minimize dust dispersion. Carefully scoop up spilled material and collect in a suitable container (with secure lid) for disposal or reclamation.
- Cleanup personnel should wear personal-protective equipment to prevent skin or eye contact and inhalation of dust, solution mist, or toxic HCN gas.
- For liquid (solution) spills, cover material with an inert solid absorbent (vermiculite, dry sand, etc.) and scoop into an appropriate container (with secure lid) for disposal in accordance with existing regulations. Dike with inert absorbent material, as needed, to contain and limit spill area. Keep cyanide out of sewers and water courses!
- Do not allow acid materials to contact spilled material!
- Decontaminate liquid or solid residues in spill area with strong sodium or calcium hypochlorite solution.

DISPOSAL OF SMALL QUANTITIES:

- Contact your supplier or a licensed disposal contractor for specific treatment/disposal procedures.
- Cyanide must be oxidized to harmless waste before disposal. An alkaline (pH about 10) solution of waste is treated with calcium or sodium hypochlorite in slight excess to decompose cyanide. When cyanide free, it can be neutralized and flushed to drain with large excess of water (unless it contains heavy metal or other materials requiring further action).

DISPOSAL OF LARGER AMOUNTS: Contact a licensed disposal company.

*** FOLLOW ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS FOR ALL WASTE DISPOSAL ***

SECTION 4: HEALTH HAZARDS

Potassium cyanide has not been identified as a known or suspected carcinogen by the NTP, IARC, or OSHA.

Current ACGIH TLV: 8-hr. TWA: 5 mg/m³ (as CN). (Skin absorption can contribute significantly to the TLV.) NIOSH has proposed a ceiling level of 5 mg/m³ (as CN), sampled over 10 min. of combined cyanide and HCN exposure. An action level of 2.5 mg/m³ was proposed.

- Human, Oral, LDLo: 2.86 mg/kg
- Rat, Oral, LD₅₀: 10 mg/kg
- Rabbit, Oral, LD₅₀: 5 mg/kg
- Cyanide is fast acting, highly poisonous by ingestion (<250 mg adult lethal dose).
- It can enter the body through skin absorption (especially through open wounds) or by inhalation of dust, solution mist, or HCN.
- Cyanide prevents cells of the body from using oxygen.
- Overexposure causes headache, dizziness, weakness, profuse ineffective breathing, and nausea, which can be followed by weak and irregular heartbeat, unconsciousness, convulsions, coma, and death.
- KCN is alkaline and thus irritating and corrosive to body tissue it contacts. Repeated minor contact causes "cyanide rash."

SECTION 5: FIRST AID PROCEDURES

HAVE MEDICAL HELP NOTIFIED IMMEDIATELY IN ALL CASES!

Eye contact:

- Flush eyes promptly with plenty of running water for at least 15 minutes, including under the eyelids.
- Get prompt medical attention.* (Ophthalmologist preferred)

Skin contact:

- Flush affected area with large amounts of water. Wash exposed areas of skin with soap and water.
- Remove contaminated clothing promptly.
- Contact medical personnel.* Watch for symptoms of toxic exposure.

Inhalation:

- Remove victim to fresh air; restore and/or support breathing as necessary. Keep victim warm and at rest. Give oxygen if available.
- Contact medical personnel.* Administer amyl nitrite perles by inhalation according to directions (Lilly Cyanide Antidote Kit).

Ingestion: (Follow cyanide antidote kit procedures.)

- Quickly give conscious victim a pint of 1% sodium thiosulfate soln. and induce vomiting. Repeat. Use amyl nitrite perles (from Lilly Cyanide Antidote Kit).
- Get prompt medical attention.*
- Never give anything by mouth to a person who is unconscious or convulsing.

* Get medical help (in school, paramedic, or community), for further treatment, observation, and support after first aid.

SECTION 6: FIRE PROCEDURES AND DATA

- KCN is not combustible.
- Contact of this material with acid (or CO₂) will liberate highly toxic, flammable HCN gas.
- If body contact occurs with KCN or its solutions, flush with water immediately and remove contaminated clothing.
- Extinguishing media: Water spray (DO NOT USE CO₂).
- For major fires, or if large quantities of this material are involved, fire fighters should wear appropriate protective clothing and use respiratory protection. Self-contained breathing apparatus is recommended.
- A water spray may be used to cool fire-exposed containers and disperse vapors.

FLASH POINT AND METHOD(S) ... Not Combustible

AUTOIGNITION TEMPERATURE ... Not Combustible

FLAMMABILITY LIMITS IN AIR (vol. %) : ... Not Combustible

SECTION 7: PHYSICAL DATA

SOLUBILITY IN WATER (@ 25°C) ... 71.6 g/100g

pH OF AQUEOUS SOLUTION (0.1N) ... 11.0

SPECIFIC GRAVITY (@ 16°C) ... 1.52

MELTING POINT ... 1173°F (634°C)

MOLECULAR WEIGHT ... 65.12

DATA SOURCES: Genium's Industrial MSDSs #13 (5/80) and #58 (4/80) and references 2-9, 12, 19, 501, 506, 509-511, 518.
(see glossary for titles)

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