



# Material Safety Data Sheet









## EMERGENCY NUMBERS:

(USA) CHEMTREC : 1(800) 424-9300 (24hrs)

(CAN) CANUTEC : 1(613) 996-6666 (24hrs)

(USA) Anachemia : 1(518) 297-4444

(CAN) Anachemia : 1(514) 489-5711

WHMIS	Protective Clothing	TDG Road/Rail
WHMIS CLASS: D-1A D-2B		TDG CLASS: 6.1 PIN: UN1713 PG: I
 	    	

## Section I. Product Identification and Uses

<b>Product name</b>	<b>ZINC CYANIDE</b>	<b>CI#</b>	Not available.
<b>Chemical formula</b>	Zn(CN) <sub>2</sub>	<b>CAS#</b>	557-21-1
<b>Synonyms</b>	Zinc dicyanide, AC-9945T, 98026	<b>Code</b>	AC-9945T
<b>Supplier</b>	Anachemia Canada. 255 Norman. Lachine (Montreal), Que H8R 1A3	<b>Formula weight</b>	117.42
<b>Material uses</b>	For laboratory use only.		
		<b>Supersedes</b>	

## Section II. Ingredients

Name	CAS #	%	TLV
1) ZINC CYANIDE	557-21-1	60-100	Exposure limits: ACGIH (Hydrogen cyanide and cyanide salts (as CN)) Ceiling limit 5 mg(CN)/m <sup>3</sup> (skin)

### Toxicity values of the hazardous ingredients

ZINC CYANIDE:  
ORAL (LD50): Acute: 54 mg/kg (Rat).

**Section III. Physical Data**

<b>Physical state and appearance / Odor</b>	Solid. (White powder. Odorless.)
<b>pH (1% soln/water)</b>	Not applicable.
<b>Odor threshold</b>	Not available.
<b>Percent volatile</b>	Not available.
<b>Freezing point</b>	Decomposes at 800°C.
<b>Boiling point</b>	Not applicable.
<b>Specific gravity</b>	1.852 (Water = 1)
<b>Vapor density</b>	Not available.
<b>Vapor pressure</b>	Not available.
<b>Water/oil dist. coeff.</b>	Not available.
<b>Evaporation rate</b>	Not available.
<b>Solubility</b>	Insoluble in cold water.

**Section IV. Fire and Explosion Data**

<b>Flash point</b>	Not available.
<b>Flammable limits</b>	Not available.
<b>Auto-ignition temperature</b>	Not available.
<b>Fire degradation products</b>	Oxides of carbon, zinc, and nitrogen. Hydrogen cyanide.
<b>Fire extinguishing procedures</b>	Use extinguishing media suitable for surrounding materials. Wear adequate personal protection to prevent contact with material or its combustion products. Self contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode. Cool containing vessels with flooding quantities of water until well after fire is out. Move containing vessels from fire if without risk.
<b>Fire and Explosion Hazards</b>	Evolves very toxic and flammable gas on contact with acids (hydrogen cyanide). Contact with oxidizers may cause fire and/or explosion. The sensitivity to static discharge is not available. The sensitivity to impact is not available. Emits toxic fumes under fire conditions.

**Section V. Toxicological Properties**

<b>Routes of entry</b>	Ingestion and inhalation. Eye contact. Skin contact. Skin absorption.
<b>Effects of Acute Exposure</b>	May be fatal by ingestion, inhalation, or by skin absorption. Irritant. Contact with acids or weak alkalis liberates poisonous gas.
<b>Eye</b>	Causes severe irritation or burns and loss of vision. May cause permanent damage.
<b>Skin</b>	Causes severe irritation. Prolonged exposure may result in skin burns and ulcerations. Readily absorbed through skin. See inhalation.
<b>Inhalation</b>	Highly toxic. Effects of skin contact, inhalation or ingestion overexposure to cyanide are characterized by central nervous system depression. Symptoms may include: reddening of the eyes, palpitation, difficulty in breathing, salivation, numbness, nausea, vomiting, headache, weakness of arms and legs, giddiness, dizziness, asphyxia, hypotension, collapse, and convulsions. Convulsions, coma and death due to respiratory arrest may occur. Cyanosis (bluish discoloration of the skin) is a sign that follows cardiovascular collapse and apnea.
<b>Ingestion</b>	Highly toxic. See inhalation.

**Section V. Toxicological Properties**

**Effects of Chronic Overexposure** May cause headache, nausea, dizziness, weakness, pulmonary edema, anorexia, mental confusion, lung damage, skin eruptions. Carcinogenic effects: Not available. Mutagenic effects: Not available. Teratogenic effects: Not available. Toxicity of the product to the reproductive system: Not available. To the best of our knowledge, the chemical, physical, and toxicity of this substance has not been fully investigated.

**Section VI. First Aid Measures**

**Eye contact** Immediately flush eyes with copious quantities of water for at least 20 minutes holding lids apart to ensure flushing of the entire surface. Seek immediate medical attention. See section 10.

**Skin contact** Immediately flush skin with plenty of water and soap for at least 20 minutes while removing contaminated clothing and shoes. Seek immediate medical attention. See section 10.

**Inhalation** Remove patient to fresh air. Seek immediate medical attention. See section 10.

**Ingestion** Call a poison control centre immediately. If consciousness is impaired, oxygen and amyl nitrite should be administered as indicated in section 10. Never give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention.

**Section VII. Reactivity Data**

**Stability** Unstable. Moisture sensitive! Conditions to avoid: High temperatures, sparks, open flames and all other sources of ignition, contamination.

**Hazardous decomp. products** Hydrogen cyanide.

**Incompatibility** Reacts violently with oxidizing agents, magnesium, chlorates, fluorine, nitrates, nitrites, chromium, potassium, nitric acid. Carbon dioxide. Large amounts of poisonous, flammable hydrogen cyanide (HCN) gas will be evolved from contact with acids or acid salts. Water or weak alkaline solution can produce dangerous amounts of HCN in confined areas.

**Reaction Products** Evolves hydrogen cyanide on contact with acids or carbon dioxide. Readily hydrolyzed by moisture, with the liberation of hydrogen cyanide. Hazardous polymerization will not occur.

## Section VIII. Preventive Measures

ZINC CYANIDE

page 4/4

<b>Protective Clothing in case of spill and leak</b>	Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves. Wear disposable coveralls and discard them after use. A self contained breathing apparatus should be used to avoid inhalation of the product.
<b>Spill and leak</b>	Evacuate the area. Stay upwind: Keep out of low areas. Cover with DRY sand, mix carefully. Place in a suitable closed container and mark for disposal. Avoid raising dust. Ventilate area and wash spill site after material pick up is complete. DO NOT empty into drains. DO NOT touch damaged container or spilled material. DO NOT get water inside container. DO NOT clean-up or dispose of, except under supervision of a specialist.
<b>Waste disposal</b>	According to all applicable regulations. This material and its container must be disposed of in a safe way. Harmful to aquatic life at very low concentrations. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.
<b>Storage and Handling</b>	Store in a cool place away from heated areas, sparks, and flame. Store in a well ventilated area. Store away from incompatible materials. Do not add any other material to the container. Do not wash down the drain. Do not breathe dust/gas/fumes/vapor/spray. In case of insufficient ventilation, wear suitable respiratory equipment. Keep away from direct sunlight or strong incandescent light. Keep container tightly closed and dry. Manipulate under an adequate fume hood. Avoid raising dust. Empty containers may contain a hazardous residue. Handle and open container with care. Minimize dust generation and exposure - use dust mask or appropriate protection. Take off immediately all contaminated clothing. This product must be manipulated by qualified personnel. Do not get in eyes, on skin, or on clothing. Wash well after use. In accordance with good storage and handling practices. Do not allow smoking and food consumption while handling. Wear suitable protective clothing. In case of accident or if you feel unwell, seek medical advice immediately (show the label when possible.). Protect from moisture. May react in presence of moisture.

## Section IX. Protective Measures

<b>Protective clothing</b>	Splash goggles. Impervious gloves, apron, coveralls, and/or other resistant protective clothing. Sufficient to protect skin. Wear appropriate MSHA/NIOSH approved chemical cartridge respirator. If more than TLV, do not breathe vapor. Wear self-contained breathing apparatus. Have available and use as appropriate: face shield, rubber suits, aprons, and boots; disposable toxic dust and mist respirators, self-contained breathing apparatus (SCBA) (in case of emergency), hydrogen cyanide detector, first aid and medical treatment supplies, including oxygen resuscitators. Do not wear contact lenses. Make eye bath and emergency shower available. Ensure that eyewash station and safety shower is proximal to the work-station location.
<b>Engineering controls</b>	Use in a chemical fume hood to keep airborne levels below recommended exposure limits. Do not use in unventilated spaces. Have available and use as appropriate: face shield, rubber suits, aprons, and boots; disposable toxic dust and mist respirators, self-contained breathing apparatus (SCBA) (in case of emergency), hydrogen cyanide detector, first aid and medical treatment supplies, including oxygen resuscitators.

## Section X. Other Information

<b>Special Precautions or comments</b>	<p>Highly toxic! Severe irritant! May cause burns. Do not breathe dust, mist, or HCN gas! Avoid all contact with the product. Avoid prolonged or repeated exposure. Use in a chemical fume hood. Moisture sensitive. Handle and open container with care. Container should be opened only by a technically qualified person. On regular bases verify which hospital or antipoison center has cyanide antidote kit. Only physician can administer the antidote. RTECS NO: ZH1575000 (Zinc cyanide).</p> <p><b>FIRST AID MEASURES:</b> A step-wise procedure of "First Aid" and "Medical Treatment" is recommended for any cyanide poisoning. Treatment requires immediate action to prevent harm or death. First Aid is given initially, and experience shows that when given promptly it is usually the only treatment needed for typical accidental poisonings. Medical treatment may be needed for more severe poisoning. First aid treatment uses oxygen and amyl nitrite and can be given by a first responder before medical help arrives. Medical treatment is given if the patient does not respond to First Aid. Medical treatment is a more aggressive treatment requiring intravenous injections of sodium nitrite and sodium thiosulfate, and must be administered by qualified medical personnel. It provides a larger quantity of antidote which also helps eliminate cyanide from the body. Even if a doctor or nurse is present, the need for fast treatment dictates using the First Aid procedure with oxygen and amyl nitrite while Medical Treatment materials for intravenous injection are being prepared. When antidotal treatment is necessary, it should be started immediately. In case of cyanide poisoning, start First Aid treatment immediately, then call a physician.</p> <p><b>FIRST AID PROCEDURE:</b> The exposed person should be removed from the contaminated area, contaminated clothing removed and the individual washed off. The rescuer and/or person providing first aid is subject to exposure if the affected person's clothing is wetted with cyanide. For HYDROGEN CYANIDE, rescue of a wetted person should be done wearing self-contained breathing air (SCBA), rubber gloves, and other personal protective equipment as necessary. For cyanide dusts or solutions, SCBA is normally not needed. Contact with HYDROGEN CYANIDE must be avoided by rescuers, but short contact from solid cyanide or solutions is normally not a problem if skin washing is prompt. As soon as possible, even while clothing is being removed or washing is taking place, First Aid should be started.</p> <ol style="list-style-type: none"><li>1) If no symptoms are evident, no treatment is necessary; decontaminate patient.</li><li>2) If conscious but symptoms (nausea, difficulty breathing, dizziness, etc.) are evident, give oxygen.</li><li>3) If consciousness is impaired (non-responsiveness, slurred speech, confusion, drowsiness) or the patient is unconscious but breathing, give oxygen and amyl nitrite by means of a respirator. To give amyl nitrite, break an ampoule in a gauze pad and insert into lip of mask for 15 seconds, then take away for fifteen seconds. Repeat 5-6 times. If necessary, use a fresh ampoule every 3 minutes until the patient regains consciousness (usually 1-4 ampoules). Administer oxygen continuously. Guard against the ampoule entering the patient's mouth.</li><li>4) If not breathing, give oxygen and amyl nitrite immediately by means of a positive pressure respirator (artificial respirator). See 3. above, and continue to give oxygen simultaneously to aid recovery. If massive exposure occurred, consider keeping the first one or two ampoules in the lip of the mask continuously. Guard against the ampoule entering the patient's mouth.</li></ol> <p><b>MEDICAL TREATMENT:</b> Experience shows that First Aid given promptly is usually the only treatment needed for typical industrial cyanide poisoning. Larger cyanide poisonings increase the need for Medical Treatment. Do not over-react. Although prompt action is essential when poisoning has occurred, a lucid, conscious person who can communicate may not have significant cyanide poisoning and Medical Treatment will rarely be necessary. "Treat what you see" is a good rule of thumb. Mildly symptomatic patients who remain alert may be managed by supportive care only. The half-life of cyanide in the body is about 20-90 minutes. In diagnosis and monitoring of patients, the critical period for treatment is short. Normally the effects from cyanide poisoning occur in the first few minutes and will indicate the degree of poisoning. "Preventive" use of cyanide antidote in the absence of impaired consciousness is not normally warranted. Keep the patient calm by reassurance over the next 30 minutes, and closely monitor the patient's condition. If skin contact with cyanide has been prolonged and/or extensive cyanide has been ingested, watch the individual closely for at least 30 minutes to assure there are no effects from delayed absorption of cyanide into the blood stream. Consider assuring intravenous access in cases where significant toxicity is possible. Establishment of IV access with normal saline, Ringer's lactate, or other available IV fluid will facilitate administration of the antidote if necessary.</p> <p><b>MEDICAL TREATMENT PROCEDURE:</b></p> <ol style="list-style-type: none"><li>1) Sodium nitrite: Adult - 10 ml of 3% solution (300 mg). Draw solution from the ampoule and inject slowly over 4-5 minutes (2 to 2.5 ml/minute). As soon as practical, monitor blood pressure and continue checking pulse. Slow the rate of injection if hypotension (low blood pressure) occurs.</li><li>2) Sodium thiosulfate: Adult - 50 ml of 25% solution (12.5 grams). Follow sodium nitrite with sodium thiosulfate injected at a rate of 2.5 ml/minute (10-20 minutes).</li></ol> <p>The total time for injection of these initial doses of both components at the recommended rates is lengthy, approximately 20-25 minutes. Consider the body weight and condition of the patient when treating a cyanide exposed patient with sodium nitrite. Both amyl nitrite and sodium nitrite produce methemoglobin, which reduces the oxygen carrying capacity of the blood. Methemoglobinemia is potentially harmful when methemoglobin levels exceed 20-30%. If symptoms persist or recur after the initial treatment, repeat the antidote at one half the original doses one hour after the original administration. Monitor methemoglobin levels when practical in every patient treated with the intravenous antidote. Avoid over-treatment. The above sodium nitrite injection is about one-third the lethal dose, so care should be taken to avoid excessive use. It is not essential that full quantities of antidote be given just because treatment was started. Should injection be stopped for any reason, keep track of the amount administered in case treatment needs to be restarted.</p> <p><b>RECOVERY AND DISPOSITION:</b> For most accidental poisonings, patients can be revived in a few minutes using oxygen and amyl nitrite with complete recovery within a few hours. If necessary, the patient should be monitored for 24-48 hours. Any patient whose symptoms require the use of IV antidote should be considered for admittance to an intensive care unit. Observe for return of symptoms. Monitor methemoglobin levels, blood pH and oxygenation through arterial blood gas analysis. Calculate anion gap from serum electrolytes. Cyanide poisoning causes lactate accumulation and an anion gap metabolic acidosis. Delayed neurotoxic effects are not expected consequences of cyanide exposure although these neurotoxic effects may occur if hypoxia (oxygen deficiency) was prolonged or occurred following massive cyanide exposure. In the presence of smoke inhalation that can occur during fires, withholding amyl nitrite or sodium nitrite administration should be considered because of the potential for high carboxyhemoglobin levels. However, administration of oxygen and possibly thiosulfate should be continued.</p>
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NFPA

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