

<b>List</b>	<b>Material Safety Data Sheet (Documentation Requirements)</b>
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**Section 1 – Product and Company Information**

<b>Product Name</b>	<b>Hemoglobin</b>	<b>Emergency Telephone No.</b>
<b>Catalog Number</b>	H526-480, H526-6L	CHEMTREC (800) 424-9300
<b>Product Type</b>	Clinical Chemistry Reagent	International CHEMTREC (703) 527-3887
<b>Company Name</b>	Teco Diagnostics	<b>Company Telephone No.</b>
<b>Street Address</b>	1268 N. Lakeview Avenue	(800) 222-9880 or (714) 693-7788 Monday - Friday 8:00-4:30 PST
<b>City, State, Zip Code, Country</b>	Anaheim, CA 92807 USA	Fax No. (714) 693-3838

**Section 2 – Composition/Information on Ingredients**

	Chemical Names	Concentration	CAS#
Hemoglobin Reagent:	Potassium ferricyanide	0.5 mM	13746-66-2
	Potassium cyanide	0.7 mM	151-50-8
Hemoglobin Standard:	Methemoglobin	30 g/dL	None

Other components either non-hazardous or at concentrations below that requiring hazardous listing.

**Section 3 – Hazards Identification**

<b>Emergency Overview:</b>						
Note: The following information applies to the component materials at higher concentrations than present in the reagent. Although lower concentrations are present in the reagent, appropriate safety precautions should still be taken.						
Potassium ferricyanide:	Irritant. Irritating to eyes, respiratory system, and skin. Contact with acids liberates very toxic gas.					
Potassium cyanide:	Highly Toxic (USA) Very Toxic (EU). Dangerous for the environment. Very toxic by inhalation, in contact with skin and if swallowed. Contact with acids liberates very toxic gas. Causes burns. Very toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment. Target organ(s): Blood, Central nervous system.					
	<b>HMIS Rating</b>			<b>NFPA Rating</b>		
	<b>Health</b>	<b>Flammability</b>	<b>Reactivity</b>	<b>Health</b>	<b>Flammability</b>	<b>Reactivity</b>
Potassium ferricyanide:	1	0	1	1	0	1
Potassium Cyanide:	3*	0	1	3	0	1
	*additional chronic hazards present					
For additional information on toxicity, please refer to section 11.						

**Section 4 – First Aid Measures**

<b>Oral Exposure</b>
If swallowed, wash out mouth with large amounts of water provided person is conscious. Call a physician.
<b>Inhalation Exposure</b>
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.
<b>Dermal Exposure</b>
In case of skin contact, immediately wash skin with soap and copious amounts of water. Remove and wash contaminated clothing and shoes. Call a physician
<b>Eye Exposure</b>
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician

**Section 5- Fire and Explosive Hazard Data**

<b>Extinguishing Media</b>	<b>Autoignition Temp</b>
Suitable: Appropriate foam.	N/A
Unsuitable: Do not use carbon dioxide extinguisher on this material.	
<b>Firefighting Measures</b>	
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.	
Unusual Fire & Explosion Hazards: Emits toxic fumes under fire conditions.	
<b>Specific Method(s) of Fire Fighting:</b>	
Potassium cyanide: Fire fighting hazard: water spray can be used to fight fire in area containing cyanide and to cool fire-exposed metal containers. However, direct contact of material with water or steam will cause decomposition liberating highly toxic hydrogen cyanide gas as well as generating a highly hazardous solution of dissolved cyanide which must be kept out of sewers and watercourses. Cyanide has been found to form explosive mixtures sometimes spontaneously with chlorates, nitrates, and nitrogen trichloride plus ammonia.	

**Section 6 – Accidental Release Measures**

<b>Procedure to be Followed in Case of Leak or Spill</b>	<b>Procedures of Personal Precaution</b>
Absorb on inert material. Place material and contaminated disposables into a suitable container, seal, label and hold for disposal. Ventilate the area and wash spill site after material pickup is complete.	Wear respirator, chemical safety goggles, rubber boots and heavy rubber gloves.
<b>Methods for Cleaning Up and Disposal</b>	
Waste Disposal Method: Dispose of in accordance with federal, state, and local regulations.	

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**Hemoglobin****Section 7 – Handling and Storage****Handling**

Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.  
Avoid inhalation or ingestion. Do not pipette by mouth. Refer to Section 8

**Storage**

Keep tightly closed. Store according to package directions.

**Section 8 – Exposure Controls / PPE****Engineering Controls**

Safety shower and eye wash should be available.  
Ventilation: General room ventilation is satisfactory.

**General Hygiene Measures**

Wash thoroughly after handling.  
Wash contaminated clothing before reuse.

**Personal Protective Equipment**

Respiratory Protection: None required where adequate ventilation is satisfactory.  
Protective Gloves: Chemical-resistant gloves required.  
Eye Protection: Chemical safety goggles recommended.  
Other Protective Equipment: Lab coat recommended. Use a safety pipette device.

**Exposure Limits: Potassium Cyanide:**

Country	Type	Value
Poland	NDS	---
Poland	NDSCh	---
Poland	NDSP	5 mg/m <sup>3</sup>

**Exposure Limits, RTECS: Potassium Cyanide (RTECS # TS8750000)**

Country	Source	Type	Value	Remarks
New Zealand	OEL	---	---	Check ACGIH TLV
USA	NIOSH	Ceiling concentration	4.7 PPM (CN) / 10M	---

**Section 9 - Physical Data**

Boiling Point	Specific Gravity (g/cm <sup>3</sup> )	Solubility in Water	Appearance
N/A	N/A	Soluble	Reagent: Yellow liquid Standard: Red liquid

**Section 10 – Stability and Reactivity**

Chemical	Stable	Conditions of Instability	Materials to Avoid
Potassium ferricyanide	Stable	May discolor on exposure to light	Strong acids. Strong oxidizing agents.
Potassium cyanide	Stable	May decompose on exposure to moist air or water. Absorbs carbon dioxide from air. Light sensitive.	Avoid contact with acid., Iodine, Permanganates, Peroxides, Metallic salts, Chloral hydrate, Alkaloids, Chlorates

**Hazardous Decomposition Products**

Carbon monoxide, carbon dioxide, nitrogen oxides, hydrogen cyanide, potassium oxides.

**Hazardous Polymerization**

Will not occur.

**Section 11 – Toxicological information**

<b>Route of exposure</b> <b>Potassium ferricyanide:</b> Skin contact: Causes skin irritation. Skin absorption: May be harmful if absorbed through the skin. Eye contact: Causes eye irritation. Inhalation: May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract. Ingestion: May be harmful if swallowed.	<b>Signs and Symptoms of Exposure</b> <b>Potassium ferricyanide:</b> To the best of our knowledge, the chemical, physical and toxicological properties of have not been thoroughly investigated.
<b>Route of exposure</b> <b>Potassium Cyanide:</b> Skin contact: May cause skin irritation. Skin absorption: May be fatal if absorbed through the skin. Eye contact: May cause eye irritation. Inhalation: May be fatal if inhaled. Material may be irritating to mucous membranes and upper respiratory tract. Ingestion: May be fatal if swallowed. Target organ(s): Blood. Central nervous system. Cardiovascular system. Thyroid.	<b>Signs and Symptoms of Exposure</b> <b>Potassium Cyanide:</b> Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Exposure can cause: Lung irritation. Cyanosis. CNS depression. To the best of our knowledge, the chemical, physical and toxicological properties of have not been thoroughly investigated.

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**Hemoglobin****Section 11 – Toxicological information (Continued)****Toxicity Data: Potassium ferricyanide:**

Species:	Dose:	Route of Application:	Result:
Mouse	2,970 mg/kg	Oral	LD50

Note: Only selected Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information. (RTECS#: LJ8225000)

**Toxicity Data: Potassium Cyanide:**

Species:	Dose:	Route of Application:	Result:	Remarks:
Human	2.857 mg/kg	Oral	LDLO	---
Rat	5 mg/kg	Oral	LD50	---
Rat	4 mg/kg	Intraperitoneal	LD50	Lungs, Thorax, or Respiration: Other changes.
Rat	7814 ug/kg	Subcutaneous	LD50	---
Rat	3600 ug/kg	Intravenous	LD50	Behavioral: Altered sleep time (including change in righting reflex). Behavioral: Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration: Dyspnea.
Mouse	8.5 mg/kg	Oral	LD50	---
Mouse	5991 ug/kg	Intraperitoneal	LD50	---
Mouse	6500 ug/kg	Subcutaneous	LD50	---
Mouse	2600 ug/kg	Intravenous	LD50	Peripheral Nerve and Sensation: Flaccid paralysis without anesthesia (usually neuromuscular blockage). Behavioral: Convulsions or effect on seizure threshold. Lungs, Thorax, or Respiration: Respiratory stimulation.
Dog	6 mg/kg	Subcutaneous	LD50	Behavioral: Convulsions or effect on seizure threshold.
Cat	2200 mg/kg	Intravenous	LD50	---
Rabbit	5 mg/kg	Oral	LD50	---
Rabbit	3972 ug/kg	Intraperitoneal	LD50	Blood: Other changes.
Rabbit	4 mg/kg	Subcutaneous	LD50	Lungs, Thorax, or Respiration: Other changes.
Rabbit	3256 ug/kg	Intramuscular	LD50	---
Rabbit	7870 ug/kg	Ocular	LD50	Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Eye: Other. Behavioral: Ataxia. Lungs, Thorax, or Respiration: Respiratory stimulation.
Pigeon	4 mg/kg	Intramuscular	LD50	---

Note: Only selected Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information. (RTECS#: TS8750000)

**Chronic Exposure – Teratogen: Potassium Cyanide:**

Species:	Dose:	Route of Application:	Exposure Time:	Result:
Rat	40 mg/kg	Intraperitoneal	1-15 D PREG	Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

**Chronic Exposure – Mutagen: Potassium Cyanide:**

Species:	Dose:	Cell Type:	Mutation Test:
Rat	300 umol/L	Liver	DNA damage
Mouse	1 mmol/L	Lymphocyte	DNA inhibition
Mouse	1 mmol/L	Mammary gland	Cytogenetic analysis

**Chronic Exposure – Reproductive Hazard: Potassium Cyanide:**

Species:	Dose:	Route:	Exposure Time:	Result:
Rat	65 gm/kg	Oral	14 D PRE / 1-22 D PREG	Effects on Fertility: Other measures of fertility
Domestic Animals	1767 mg/kg	Oral	8-20W PREG / 44D POST	Effects on Newborn: Weaning or lactation index (e.g., # alive at weaning per # alive at day 4). Effects on Newborn: Other neonatal measures or effects.

**Section 12 – Ecological information****Acute Ecotoxicity Tests: Potassium Cyanide:**

Test Type:	Species:	Time:	Value:
LC50 Fish	Lepomis macrochirus (Bluegill)	96 H	0.45 mg/L
EC50 Daphnia	Daphnia magna	48 H	2 mg/L
EC50 Daphnia	Daphnia magna	24 H	0.53 mg/L

**Section 13 – Disposal Considerations**

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state and local environmental regulations.

**Section 14 – Transport Information**

Product is stable under normal conditions. Product is non-hazardous for transport.

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**Hemoglobin**

**Section 15 - Regulatory Information**

<p><b>Potassium ferricyanide:</b>                  EU Additional Classification                  Symbol of Danger: Xi                  Indication of Danger: Irritant.                  Risk Statements: R: 32 36/37/38                  Contact with acids liberates very toxic gas. Irritating to eyes, respiratory system and skin.                  Safety Statements: S: 26 36                  In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.</p>	<p><b>Potassium ferricyanide:</b>                  US Classification and Label Text                  Indication of Danger: Irritant                  Dangerous for the environment.                  Risk Statements: Irritating to eyes, respiratory system and skin. Contact with acids liberates very toxic gas.                  Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.                   United States Regulatory Information                  SARA Listed: No                  Notes: This product is subject to SARA section 313 reporting requirements.                  TSCA Inventory Item: Yes</p>
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<p><b>Potassium Cyanide:</b>                  EU Directives Classification                  Symbol of Danger: T+ N                  Indication of Danger: Very toxic. Dangerous for the environment.                  R: 26/27/28 32 50/53                  Risk Statements: Very toxic by inhalation, in contact with skin and if swallowed. Contact with acids liberates very toxic gas.                  Very toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.                  S: 7 28 29 45 60 61                  Safety Statements: Keep container tightly closed. After contact with skin, wash immediately with plenty of soap-suds. Do not empty into drains. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.</p>	<p><b>Potassium Cyanide:</b>                  US Classification and Label Text                  Indication of Danger: Highly Toxic (USA) Very Toxic (EU).                  Dangerous for the environment.                  Risk Statements: Very toxic by inhalation, in contact with skin and if swallowed. Contact with acids liberates very toxic gas. Causes burns. Very toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment.                  Safety Statements: Keep container tightly closed. After contact with skin, wash immediately with plenty of water. Do not empty into drains. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.                  US Statements: Target organ(s): Blood. Central nervous system.</p>
<p>Canada Regulatory Information                  WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.                  DSL: Yes                  NDSL: No</p>	<p>United States Regulatory Information                  SARA Listed: Yes                  Notes: This product is subject to SARA section 313 reporting requirements.                  TSCA Inventory Item: Yes</p>

**Section 16 – Other Information**

<p>This Product is labeled in accordance with CFR21 (Food and Drugs), Section 809.10.</p>
<p>The information contained herein has been compiled from data presented in various technical sources believed to be accurate. We make no warranties, express or implied, and assume no liability in connection with the use of this information. It is the user’s responsibility to determine the suitability of this information and to assure the adoption of necessary safety precautions.</p>

N/A - Not Applicable or Not Available

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