Section 1: Identification

MANUFACTURER: PACE Technologies
3601 E. 34th St.
Tucson, AZ 85713

INFORMATION PHONE: 520-882-6598

EMERGENCY PHONE: CHEMTREC 800-424-9300 (US) Day or night

Customer No. 16568

TRADE NAME: Murakami's Reagent

CHEMICAL FAMILY: Cyanide Solutions, N.O.S. (potassium ferricyanide, potassium hydroxide mixture)

HMIS RATING: HEALTH: 3 FLAMMABILITY: 0 REACTIVITY: 1

HAZARD RATING:

LEAST: 0 SLIGHT: 1 MODERATE: 2 HIGH: 3 EXTREME: 4

Section 2: Hazard(s) Identification

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)	Corrosive to metals (Category 1), H290 Acute toxicity, Oral (Category 4), H302 Skin corrosion (Category 1A), H314 Serious eye damage (Category 1), H318 Acute aquatic toxicity (Category 3), H402 Chronic aquatic toxicity (Category 3), H412
PICTOGRAM(s):	
SIGNAL WORD:	Danger
HAZARD STATEMENTS:	**Hazard Statement(s):** H290 - May be corrosive to metals H302- Harmful if swallowed H314- Causes severe skin burns and eye damage

	H318 - Causes serious eye damage H402- Harmful to aquatic life H412- Harmful to aquatic life with long lasting effects
PRECAUTIONARY STATEMENTS:	**Precautionary Statement(s):** **Preventions:** P234- Keep only in original container. P260- Do not breathe dust/fume/gas/mist/vapors/spray. P264- Wash skin thoroughly after handling. P270- Do not eat, drink or smoke when using this product. P273- Avoid release to the environment. P280- Wear protective gloves/protective clothing/eye protection/face protection. P406- Store in corrosive resistant container with a resistant inner liner. **Response:** P301+312- IF SWALLOWED: call a POISON CENTER or doctor/physician IF you feel unwell. P301+P330+P331- IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P304+P340- IF INHALED: Remove victim to fresh air and Keep at rest in a position comfortable for breathing. P305+P351+P338- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310- Immediately call a POISON CENTER or doctor/physician. P321- Specific treatment (see Section 4 SDS). P330- Rinse mouth. P390- Absorb spillage to prevent material damage. **Storage:** P405- Store locked up. **Disposal:** P501- Dispose of contents/container to Federal, State and Local Regulations.

Emergency Overview

CAUTION! SLIGHTLY TOXIC BY INGESTION. POISON! DANGER! CORROSIVE. CAUSES SEVERE BURNS TO SKIN, EYES, RESPIRATORY TRACT, AND GASTROINTESTINAL TRACT. MATERIAL IS EXTREMELY DESTRUCTIVE TO ALL BODY TISSUES. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED.

Health Rating: 3 - Slight (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 1 – Slight
Contact Rating: 4 – Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

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Potential Health Effects

Inhalation:
Respiratory tract irritant, may cause serious burns on acute contact. Severe injury is usually avoided by the self-limiting coughing and sneezing symptoms.
Ingestion:
Toxic! Corrosive to mucous membranes and may cause perforation of the esophagus and stomach. Abdominal pain, nausea, vomiting, general gastro-intestinal upset can be expected.
Skin Contact:
Irritant, possibly corrosive if contact is prolonged. Soreness, redness, destruction of skin may result.
Eye Contact:
Irritant, possibly corrosive to eye tissues. Tearing, redness, pain, impaired vision are symptoms.
Chronic Exposure:
Development of a defatting dermatitis on prolonged contact with potassium hydroxide has been reported. Continued irritation may lead to increased susceptibility to respiratory illness.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired kidney or respiratory function may be more susceptible to the effects of the substance.

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Section 3: Composition/Information on Ingredients

HAZARD INGREDIENTS

CHEMICAL	CAS NUMBER	% PRESENT	Hazardous
Potassium Ferricyanide	13746-66-2	10-30%	Yes
Potassium Hydroxide	1310-58-3	10-30%	Yes
Water	7732-18-5	70-85%	No

Section 4: First-Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion:
DO NOT INDUCE VOMITING. Call Poison Control immediately. Rinse mouth with cold

water. Give victim 1-2 cups of water or milk to drink.
Skin Contact:
Immediately flush skin with excess water for 15 minutes while removing contaminated clothing..
Eye Contact:
Immediately flush eyes with excess water for 15 minutes, lifting lower and upper eyelids occasionally.

Section 5: Fire-Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Avoid direct contact of liquid with water.
Special Information:
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.

Section 6: Accidental Release Measures

Use personal protection recommended in Section 8. Isolate the hazard area and deny entry to unnecessary and unprotected personnel. Contain spill with sand or absorbent material and place in sealed bag or container for disposal. Ventilate and wash spill area after pickup is complete. See Section 13 for disposal information.

Section 7: Handling and Storage

Handling: Use with adequate ventilation and do not breathe dust or vapor. Avoid contact with skin, eyes, or clothing. Wash hands thoroughly after handling.

Keep in a tightly closed container. Store in a cool, dry, ventilated area. Protect against physical damage. Separate from acids and alkalis. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

Section 8: Exposure Controls/ Personal Protection

Airborne Exposure Limits:
For Potassium Ferricyanide: None Established

For Potassium Hydroxide [1310-58-3]:
- OSHA Permissible Exposure Limit (PEL):
2 mg/m3 Ceiling

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- ACGIH Threshold Limit value (TLV):
2 mg/m3 Ceiling

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Section 9: Physical and Chemical Properties

Appearance:
Clear colorless liquid.

Odor:
No odor.

Solubility:
Soluble in water.

Density:
1.16 @ 20 C

pH:
10-14

% Volatiles by volume @ 21C (70F):
N/A.

Boiling Point:
N/A.

Melting Point:
N/A.

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Vapor Density (Air=1):
N/A.
Vapor Pressure (mm Hg):
N/A.
Evaporation Rate (BuAc=1):
N/A.

Section 10: Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Potassium oxide.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong acids, aluminum, tin, zinc, chlorinated hydrocarbons, acetone. Strong mineral acids, acid fumes.
Conditions to Avoid:
Heat, incompatibles.

Section 11: Toxicological Information

For potassium hydroxide: Oral rat LD50: 273 mg/kg; Investigated as a mutagen. Skin Irritation Data (std Draize, 50 mg/24 H): Human, Severe; Rabbit, Severe. Eye Irritation Data(Rabbit, non-std test,1 mg/24 H, rinse): Moderate.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Potassium Ferricyanide (13746-66-2)	No	No	None
Potassium Hydroxide (1310-58-3)	No	No	None
Water (7732-18-5)	No	No	None

Section 12: Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
Potassium Hydroxide: TLm: 80 ppm/Mosquito fish/ 24 hr./ Fresh water

Section 13: Disposal Considerations

Check with all applicable local, regional, and national laws and regulations. Local regulations may be more stringent than regional or national regulations. Use a licensed chemical waste disposal firm for proper disposal.

Section 14: Transportation Information

Domestic (Land, D.O.T.)

Proper Shipping Name: Cyanide Solutions, N.O.S. (Potassium ferricyanide, potassium hydroxide, mixture)
Hazard Class: 6.1
UN/NA: UN 1935
Packing Group: III
Label Codes: 6.1
Limited Quantity Shipments < 5 L

International (Air, I.C.A.O.)

Proper Shipping Name: Cyanide Solutions, N.O.S. (Potassium ferricyanide, potassium hydroxide, mixture)
Hazard Class: 6.1
UN/NA: UN 1935
Packing Group: III
Label Codes: 6.1

Section 15: Regulatory Information

--------\Chemical Inventory Status - Part 1\--------------------------------

Ingredient	TSCA	EC	Japan	Australia
Potassium Ferricyanide (13746-66-2)	Yes	Yes	Yes	Yes
Potassium Hydroxide (1310-58-3)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------------------------------

		--Canada--		
Ingredient	Korea	DSL	NDSL	Phil.
Potassium Ferricyanide (13746-66-2)	Yes	Yes	No	Yes
Potassium Hydroxide (1310-58-3)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

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--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Potassium Ferricyanide (13746-66-2)	No	No	No	No
Potassium Hydroxide (1310-58-3)	No	No	No	No
Water (7732-18-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\----------

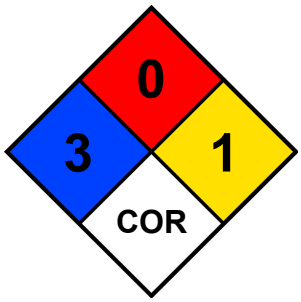
Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Potassium Ferricyanide (13746-66-2)	No	No	No
Potassium Hydroxide (1310-58-3)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2R
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Section 16: Other Information

16.1 NFPA 704



Top, Flammability: 0 – Minimal Hazard

Left, Health Hazard: 3 – Severe Hazard

Right, Reactivity: 1 – Slight Hazard

Bottom, Special Notice: COR - Corrosive

Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:
Laboratory Reagent.

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