

Section 1: Identification

MANUFACTURER: PACE Technologies
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Tucson, AZ 85713

INFORMATION PHONE: 520-882-6598

EMERGENCY PHONE: CHEMTREC 800-424-9300 (US) Day or night
Customer No. 16568

TRADE NAME: Dichromate Etchant / KEHL Dichromate reagent #13


CHEMICAL FAMILY: CORROSIVE LIQUID TOXIC, N.O.S. (Sulfuric Acid, Potassium Dichromate mixture)


HMS RATING: HEALTH: 4 FLAMMABILITY: 0 REACTIVITY: 2

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)	Oxidizing solids (Category 2), H272 Corrosive to metals (Category 1), H290 Acute toxicity, Oral (Category 3), H301 Acute toxicity, Dermal (Category 1), H310 Skin corrosion (Category 1A), H314 Serious eye damage (Category 1), H318 Acute toxicity, Inhalation (Category 2), H330 Respiratory sensitization (Category 1), H334 Germ cell mutagenicity (Category 1B), H340 Carcinogenicity (Category 1B), H350 Reproductive toxicity (Category 1B), H360 Specific target organ toxicity - repeated exposure, Inhalation (Category 1), H372 Acute aquatic toxicity (Category 1), H400 Chronic aquatic toxicity (Category 1), H410
PICTOGRAM(s):	

	
SIGNAL WORD:	Danger
HAZARD STATEMENTS:	<p>Hazard Statement(s): H272- May intensify fire; oxidizer H290 - May be corrosive to metals H301- Toxic if swallowed H310- Fatal in contact with skin H314- Causes severe skin burns and eye damage H318 - Causes serious eye damage H330- Fatal if inhaled H334- May cause allergy or asthma symptoms or breathing difficulties if inhaled H340- May cause genetic defects H350- May cause cancer H360- May damage fertility or the unborn child H372- Causes damage to organs through prolonged or repeated exposure H400- Very toxic to aquatic life H410- Very toxic to aquatic life with long lasting effects</p>
PRECAUTIONARY STATEMENTS:	<p>Precautionary Statement(s):</p> <p>Preventions: P201- Obtain special instructions before use. P202- Do not handle until all safety precautions have been read and understood. P210- Keep away from heat/sparks/open flames/hot surfaces. — No smoking. P220- Keep/Store away from clothing combustible materials. P221- Take any precaution to avoid mixing with combustibles P234- Keep only in original container. P260- Do not breathe dust/fume/gas/mist/vapors/spray. P261-Avoid breathing dust/fume/gas/mist/vapors/spray. P262- Do not get in eyes, on skin, or on clothing. P264- Wash skin thoroughly after handling. P270- Do not eat, drink or smoke when using this product. P271-Use only outdoors or in a well-ventilated area. P273- Avoid release to the environment. P280- Wear protective gloves/protective clothing/eye protection/face protection. P281- Use personal protective equipment as required. P284- P403+P233-Store in a well-ventilated place. Keep container tightly closed. P285- In case of inadequate ventilation wear respiratory protection.</p> <p>Response: P301+P310- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. P302+P350- IF ON SKIN: Gently wash with plenty of soap and water. P304+P341- IF INHALED: If breathing is difficult, 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. P308+P313- IF exposed or concerned: Get medical advice/attention. P310- Immediately call a POISON CENTER or doctor/physician.</p>

	<p>P314-Get medical advice/attention if you feel unwell. P320- Specific treatment is urgent (see Section 4 SDS). P321- Specific treatment (see Section 4 SDS). P322- Specific measures (see Section 4 SDS). P330- Rinse mouth. P342+P311- IF experiencing respiratory symptoms: call a POISON CENTER or doctor/physician. P361- Remove/Take off immediately all contaminated clothing. P363- Wash contaminated clothing before reuse. P370+P378- In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction. P390- Absorb spillage to prevent material damage. P391- Collect spillage. Hazardous to the aquatic environment</p> <p>Storage: P403+P233-Store in a well-ventilated place. Keep container tightly closed. P405- Store locked up. P406- Store in corrosive resistant container with a resistant inner liner.</p> <p>Disposal: P501- Dispose of contents/container to Federal, State and Local Regulations.</p>
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Emergency Overview

POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE A FIRE. CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. MAY CAUSE ALLERGIC REACTION. CANCER HAZARD. CAN CAUSE CANCER. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure-----

Health Rating: 4 - Extreme (Cancer Causing)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 4 - Extreme (Corrosive and Life)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:

Corrosive. Extremely destructive to tissues of the mucous membranes and upper respiratory tract. May cause ulceration and perforation of the nasal septum. Symptoms may include sore throat, coughing, shortness of breath, and labored breathing. May produce pulmonary sensitization or allergic asthma. Higher exposures may cause pulmonary edema.

Ingestion:

Corrosive. May cause sore throat, abdominal pain, diarrhea, vomiting, severe burns of the digestive tract, and kidney dysfunction.

Skin Contact:

Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. May cause violent gastroenteritis, peripheral vascular collapse, dizziness, intense thirst, muscle cramps, shock, coma, abnormal bleeding, fever, liver damage and acute renal failure

Eye Contact:

Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. May cause corneal injury or blindness.

Chronic Exposure:

Repeated or prolonged exposure can cause ulceration and perforation of the nasal septum, respiratory irritation, liver and kidney damage and ulceration of the skin. Ulcerations at first may be painless, but may penetrate to the bone producing "chrome holes." Long term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, asthma, allergies or known sensitization to chromic acid or chromates may be more susceptible to the effects of this material.

Section 3: Composition/Information on Ingredients

HAZARD INGREDIENTS

CHEMICAL	CAS NUMBER	% PRESENT	Hazardous
Sulfuric Acid	7664-93-9	5-10%	Yes
Potassium dichromate	7778-50-9	2-5%	Yes
Sodium Chloride	7647-14-5	2-10%	Yes
Water	7732-18-5	80-90%	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:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Section 5: Fire-Fighting Measures

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Releases oxygen, upon decomposition, which enhances combustion.

Explosion:

Contact with oxidizable substances may cause extremely violent combustion.

Fire Extinguishing Media:

Flood with large amounts of water. Water spray may be used to keep fire exposed containers cool. Do not allow water runoff to enter sewers or waterways.

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

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use

combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

Section 7: Handling and Storage

Protect against physical damage. Store in a dry location separate from combustible, organic or other readily oxidizable materials. Avoid storage on wood floors. Remove and dispose of any spilled dichromates; do not return to original containers. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

Section 8: Exposure Controls/ Personal Protection

Airborne Exposure Limits:

For Sulfuric Acid:

- OSHA Permissible Exposure Limit (PEL) -
1 mg/m³ (TWA)

- ACGIH Threshold Limit Value (TLV) -
0.2 mg/m³(T) (TWA) for sulfuric acid - A2 Suspected Human Carcinogen for sulfuric acid contained in strong inorganic mists.

For Potassium Dichromate:

- OSHA Permissible Exposure Limit (PEL):

For chromic acid and chromates, as CrO₃ = 0.1 mg/m³ (ceiling)

- ACGIH Threshold Limit Value (TLV):

For water-soluble Cr(VI) compounds, as Cr = 0.05 mg/m³ (TWA), A1 - confirmed human carcinogen.

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 full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Section 9: Physical and Chemical Properties

Appearance:

Orange-red liquid.

Odor:

Odorless.

Solubility:

Miscible in water.

Specific Gravity:

1.01 -1.1

pH:

No information found.

% Volatiles by volume @ 21C (70F):

No information found.

Boiling Point:

No information found.

Melting Point:

No information found.

Vapor Density (Air=1):

No information found.

Evaporation Rate (BuAc=1):

No information found.

Section 10: Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Burning may produce chrome oxides. (The following information applies to concentrated solutions of sulfuric acid). Toxic fumes of oxides of sulfur when

heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Reducing agents, acetone plus sulfuric acid, boron plus silicon, ethylene glycol, iron, hydrazine, and hydroxylamine. Any combustible, organic or other readily oxidizable material (paper, wood, sulfur, aluminum or plastics). Potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.

Conditions to Avoid:

Heat, incompatibles.

Section 11: Toxicological Information

Potassium Dichromate: Oral rat LD50: 25 mg/kg. Skin rabbit LD50: 14 mg/kg
Investigated as a tumorigen, mutagen, reproductive effector

Sulfuric acid: Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m³/2H;
standard Draize, eye rabbit, 250 ug (severe); investigated as a tumorigen,
mutagen, reproductive effector.

Sodium chloride: Oral rat LD50: 3000 mg/kg.
Inhalation rat LC50: > 42 gm/m³ /1H.
Skin rabbit LD50: > 10 gm/kg. Investigated as a mutagen, reproductive effector.

Carcinogenicity:

Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

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

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Potassium Dichromate (7778-50-9)	Yes	No	1

Sulfuric Acid (7664-93-9)	No	No	None
Sodium Chloride (7647-14-5)	No	No	None
Water (7732-18-5)	No	No	None

Section 12: Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into water, this material is not expected to evaporate significantly. This material may bioaccumulate to some extent. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition..

Environmental Toxicity:

Sulfuric acid: LC50 Flounder 100 to 330 mg/l/48 hr aerated water/Conditions of bioassay not specified; LC50 Shrimp 80 to 90 mg/l/48 hr aerated water /Conditions of bioassay not specified; LC50 Prawn 42.5 ppm/48 hr salt water /Conditions of bioassay not specified.

This material may be toxic to aquatic life.

Section 13: Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

Section 14: Transportation Information

Domestic (Land, D.O.T.)

Proper Shipping Name: CORROSIVE LIQUID TOXIC, N.O.S. (Sulfuric Acid, Potassium Dichromate Mixture)

Hazard Class: 8

UN/NA: UN 2922

Packing Group: II

Label Codes: 8, 6.1

Limited Quantity Shipments < 1 L

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

Proper Shipping Name: CORROSIVE LIQUID TOXIC, N.O.S. (Sulfuric Acid, Potassium Dichromate Mixture)

Hazard Class: 8
UN/NA: UN 2922
Packing Group: II
Label Codes: 8, 6.1

Section 15: Regulatory Information

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

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid (7664-93-9)	Yes	Yes	Yes	Yes
Potassium Dichromate (7778-50-9)	Yes	Yes	Yes	Yes
Sodium Chloride (7647-14-5)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

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

Ingredient	Korea	--Canada--		
		DSL	NDSL	Phil.
Sulfuric Acid (7664-93-9)	Yes	Yes	No	Yes
Potassium Dichromate (7778-50-9)	Yes	Yes	No	Yes
Sodium Chloride (7647-14-5)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

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

Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Sulfuric Acid (7664-93-9)	1000	1000	Yes	No
Potassium Dichromate (7778-50-9)	No	No	No	Chromium com
Sodium Chloride (7647-14-5)	No	No	No	No
Water (7732-18-5)	No	No	No	No

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

Ingredient	CERCLA	-RCRA-	-TSCA-
		261.33	8 (d)
Sulfuric Acid (7664-93-9)	1000	No	No
Potassium Dichromate (7778-50-9)	10	No	No
Sodium Chloride (7647-14-5)	No	No	No
Water (7732-18-5)	No	No	No

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

Australian Hazchem Code: 2R, 1WE

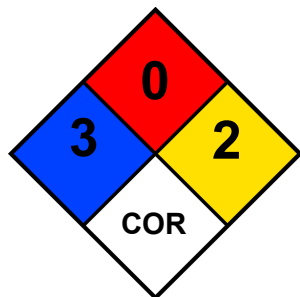
Poison Schedule: S6

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: 2 – Moderate Hazard

Bottom, Special Notice: COR – Corrosive

Label First Aid:

IN ALL CASES, CALL PHYSICIAN IMMEDIATELY. 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. Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

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