POTASSIUM DICHROMATE NORMAL VOLUMETRIC SOLUTION

1. Product Identification

Synonyms: Potassium dichromate, 0.25 Normal (N/4) Volumetric solution; Dichromic acid, potassium solution; Potassium Dichromate, DILUT-IT® Analytical Conc N/10(0.1N).

CAS No.: 7778-50-9
Molecular Weight: 294.18
Chemical Formula: K2Cr2O7 (solution)
Product Codes: 4671

2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No</th>
<th>Percent</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium Dichromate</td>
<td>7778-50-9</td>
<td>1.8 - 5%</td>
<td>Yes</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>95 - 98.2%</td>
<td>No</td>
</tr>
</tbody>
</table>

3. Hazards Identification

Emergency Overview

DANGER! CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. MAY CAUSE ALLERGIC REACTION. CANCER HAZARD. CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA™ Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Cancer Causing)
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)
Potential Health Effects

The following hazards are for concentrated solutions. Hazards of less concentrated solutions may be reduced. Degree of hazard for reduced concentrations is not currently addressed in the available literature. This compound may produce allergic sensitization in some individuals. In such cases, even a small future exposure can cause symptoms.

**Inhalation:**
Corrosive. Inhalation produces damaging effects on 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. Because this is a $\leq 5\%$ solution, effects are not expected to be as severe.

**Ingestion:**
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach. Can cause sore throat, vomiting, diarrhea. May cause abdominal pain, dizziness, intense thirst, shock and liver damage. May be followed by circulatory collapse or toxic nephritis. Because this is a $\leq 5\%$ solution, effects are not expected to be as severe.

**Skin Contact:**
Corrosive. Symptoms of redness, pain, and severe burn can occur. Dusts and strong solutions may cause severe irritation. Contact with broken skin may cause ulcers (chrome sores) and absorption, which may cause systemic poisoning, affecting kidney and liver functions. May cause skin sensitization.

**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." Known to be a human carcinogen.

**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.

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### 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.

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### 5. Fire Fighting Measures

**Fire:**
Not combustible, but substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.
Explosion:
Contact with oxidizable substances may cause violent combustion.

Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Water spray can be used to extinguish fires and cool fire-exposed containers.

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.

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. Collect liquid in an appropriate container or 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.

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. Protect from freezing. 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 (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
- 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 a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

   Appearance:
   Clear orange-red liquid.

   Odor:
   Odorless.

   Solubility:
   Completely soluble in water.

   Density:
   ca. 1.04

   pH:
   3.6 (10% solution)

   % Volatiles by volume @ 21C (70F):
   ca. 95

   Boiling Point:
   ca. 101C (ca. 214F)

   Melting Point:
   ca. -1C (ca. 30F)

   Vapor Density (Air=1):
   No information found.

   Vapor Pressure (mm Hg):
   No information found.

   Evaporation Rate (BuAc=1):
   No information found.

10. Stability and Reactivity

   Stability:
   Stable under ordinary conditions of use and storage.

   Hazardous Decomposition Products:
   Burning may produce chrome oxides.

   Hazardous Polymerization:
   Will not occur.

   Incompatibilities:
   Reducing agents, organic compounds, sulfuric acid.

   Conditions to Avoid:
   Heat, incompatibles.

11. Toxicological Information

   Investigated as a tumorigen, mutagen, reproductive effector.

   ----------------------------------     --NTP Carcinogen---
   Ingredient                      Known  Anticipated       IARC Category
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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:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to 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.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\-------------------------------
Ingredient                                          TSCA  EC  Japan  Australia
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Potassium Dichromate (7778-50-9)                  Yes  Yes   Yes      Yes
Water (7732-18-5)                                 Yes  Yes   Yes      Yes

--------\Chemical Inventory Status - Part 2\-------------------------------
Ingredient                                          Korea  DSL  NDSL  Phil.
-----------------------------------------------  -----  ---   ----  -----  
Potassium Dichromate (7778-50-9)                  Yes   Yes   No     Yes
Water (7732-18-5)                                 Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\-------------
Ingredient                     SARA 302-    -----SARA 313-----
-----------------------------------------  ---   -----   ----  --------------
Potassium Dichromate (7778-50-9)           No    No      No    Chromium com
Water (7732-18-5)                          No    No      No         No

--------\Federal, State & International Regulations - Part 2\-------------
Ingredient                    CERCLA 261.33     -TSCA-
-----------------------------------------  ------     ------    ------
Potassium Dichromate (7778-50-9)           10      No         No
Water (7732-18-5)                          No      No         No

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

WARNING:
THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.
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.

16. Other Information

NFPA Ratings: Health: 3  Flammability: 0  Reactivity: 0

Label Hazard Warning:
DANGER! CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. MAY CAUSE ALLERGIC REACTION. CANCER HAZARD. CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe dust or mist from solutions.
Keep container closed.
Store in a tightly closed container.
Use only with adequate ventilation.
Wash thoroughly after handling.
Do not store near combustible materials.

Label First Aid:
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. 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.

Revision Information:
No Changes.

Disclaimer:
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Prepared by: Environmental Health & Safety