1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

Product name: ECONO-CHROME BK
Product code: 2200798
Synonyms: No information available

Supplier:
ATOTECH USA INC
1750 OVERVIEW DRIVE
ROCK HILL, SC 29730
TELEPHONE: 803-817-3500
MONDAY - FRIDAY
HOURS: 9:00am - 5:00pm EST

ATOTECH CANADA LTD.
1180 CORPORATE DRIVE
BURLINGTON, ON., L7L 5R6
TELEPHONE: 905-332-0111
MONDAY - FRIDAY
HOURS: 8:00am - 5:00pm EST

Emergency telephone numbers:
SPILLS AND TRANSPORT CHEMTREC (USA): 800-424-9300
CANUTEC (CANADA): 613-996-6666
TRANSPORT MEDICAL ROCKY MOUNTAIN POISON CONTROL CENTER: 303-623-5716

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
- DANGER -
OXIDIZING AGENT
CORROSIVE
TOXIC
CARCINOGEN

This material is considered to be hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
This material is a controlled product under WHMIS.

Potential health & environmental effects

Properties affecting health: Corrosive effects. Toxic if swallowed. Toxic in contact with skin. Toxic by inhalation.

Principle routes of exposure: Eyes. Skin. Inhalation. Ingestion.

Skin contact: Corrosive. Causes skin burns. Toxic in contact with skin. Large exposures may be fatal. Systemic toxicity.

Eye contact: Corrosive to the eyes and may cause severe damage including blindness.


Ingestion: Corrosive. Ingestion causes burns of the upper digestive and respiratory tracts. Toxic if swallowed. Liver and kidney injuries may occur.

Physico-chemical properties: Incompatible with bases. Contact with combustible material may cause fire.

Potential environmental effects: Dangerous for the environment
3. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS (BY WEIGHT PERCENT)

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium trioxide</td>
<td>1333-82-0</td>
<td>60 - 100</td>
</tr>
<tr>
<td>Barium carbonate</td>
<td>513-77-9</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

This product may contain component(s) that are not listed under disclosure. All components not listed, do not contain hazardous materials above deminimus disclosure limits as defined by OSHA, NIOSH, ACGIH or Canadian WHMIS regulations and or guidelines. Please refer to other sections of the MSDS for information on safety, health and environmental guidelines and precautions.

4. FIRST AID MEASURES

General advice: Immediate medical attention is required.

Skin contact: Wash off immediately with plenty of water for at least 15 minutes.

Inhalation: Move to fresh air. Artificial respiration and/or oxygen may be necessary. Immediate medical attention is required.

Eye contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Ingestion: Call a physician or Poison Control Center immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

Notes to physician: Overexposure to this product could lead to kidney failure and death. It has been reported that there is little value from chelating agents; however death has been avoided in several such cases through the use of early renal dialysis. Ascorbic acid by mouth or intravenously has been shown to be effective (converting Chrome VI to Chrome III) in preventing renal tubular failure. Continue to monitor for respiratory distress for 72 hours.

Protection of first-aiders: Use personal protective equipment.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Extinguishing media which must not be used for safety reasons: DO NOT use combustible materials such as sawdust.

Special protective equipment for firefighters: Standard procedure for chemical fires. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Specific hazards: In case of fire hazardous decomposition products may be produced such as, Carbon oxides, nitrogen oxides, Sulphur oxides, chromium oxides, oxygen.

Unusual hazards: Do not allow run-off from fire fighting to enter drains or water courses. Water runoff can cause environmental damage. Corrosive. Toxic. May cause or intensify fire; oxidizer.

Specific methods: Water mist may be used to cool closed containers. Dike and collect water used to fight fire. Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Flash Point: The product is not flammable
Flash point test method: Not applicable.
Autoignition temperature: Not applicable.
Flammability Limits in Air:
   Lower: Not applicable.
   Upper: Not applicable.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Prevent unauthorized access. For personal protection see section 8.
Environmental precautions: Should not be released into the environment.
Methods for containment: Prevent further leakage or spillage if safe to do so.
Methods for cleaning up: Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal. Dispose of in accordance with local regulations. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling
   Technical measures/precautions: Use only in area provided with appropriate exhaust ventilation.
   Safe handling advice: Do not breathe vapors/dust. Handle in accordance with good industrial hygiene and safety practice. Do not ingest. For personal protection see section 8.

Storage
   Technical measures/storage conditions: Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store near combustible materials. Keep away from heat and sources of ignition.

   Incompatible products: Combustible material. Cyanides.
   Shelf Life (days): 1095

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure: Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment
   Respiratory protection: In case of insufficient ventilation wear suitable respiratory equipment.
   Hand protection: Wear protective gloves. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.
   Skin and body protection: Chemical resistant apron. Long sleeved clothing. Boots.
   Eye protection: Tightly fitting safety goggles. Face-shield. Ensure that eyewash stations and safety showers are close to the workstation location.
   Hygiene measures: Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.
9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid
Odor: Characteristic
pH: Not Determined
Melting point: Not applicable
Vapor density: Not applicable
VOC content(%): Not applicable
Solubility in other solvents: No information available

Flash Point: The product is not flammable
Autoignition temperature: Not applicable

Explosion limits:
Upper: Not applicable
Lower: Not applicable

10. STABILITY AND REACTIVITY

Stability: Stable under recommended storage conditions.
Conditions to avoid: Keep away from open flames, hot surfaces and sources of ignition.

Thermal decomposition can lead to release of irritating gases and vapors, Chromium oxides, Oxygen.
Polymerization: None under normal processing.
Hazardous reactions: None under normal processing.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Component Information

<table>
<thead>
<tr>
<th>Components</th>
<th>LD50/oral/rat</th>
<th>LC50/inhalation/8h/rat</th>
<th>LD50/dermal/rabbit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium trioxide - 1333-82-0</td>
<td>50 mg/kg</td>
<td>0.217 mg/L</td>
<td>55 mg/kg</td>
</tr>
<tr>
<td>Barium carbonate - 513-77-9</td>
<td>418 mg/kg</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Product Information

LC50/inhalation/4h/rat = No information available
LD50/dermal/rabbit = No information available
LD50/oral/rat = No information available
Local effects

Skin contact: Corrosive. Causes burns. Toxic in contact with skin.

Eye contact: Corrosive to the eyes and may cause severe damage including blindness. Liquid causes severe inflammation of conjunctiva and may cause severe damage of the cornea.

Inhalation: Corrosive. Inhaled corrosive substances can lead to a toxic edema of the lungs. Causes inflammation and ulceration of the respiratory tract. Toxic by inhalation.

Ingestion: Corrosive. Ingestion causes burns of the upper digestive and respiratory tracts. Toxic if swallowed. May be fatal if swallowed.

Sensitization: May cause sensitization by inhalation and skin contact.

Chronic effects:
Repetitive inhalation of chronic acid causes nasal perforation, skin ulceration, chronic rhinitis, pharyngitis, kidney and liver damage, inflammation of the larynx, changes in the blood, and lung cancer. Carcinogenic effects caused by chronic acid and by alkaline or alkaline earth chromates and dichromates as well as zinc chromate. This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

Specific effects

Carcinogenic effects: The National Toxicology Program (NTP) has designated Hexavalent Chromium Compounds as Known Human Carcinogens. The International Agency for Research on Cancer (IARC) has identified Hexavalent Chromium Compounds as Carcinogenic to Humans (group 1). The American Conference of Governmental Industrial Hygienists (ACGIH) has identified Water-Soluble Hexavalent Chromium Compounds as Confirmed Carcinogens.

Mutagenic effects: No information available

Reproductive toxicity: No information available


Carcinogenic substances

<table>
<thead>
<tr>
<th>Components</th>
<th>NTP: Known Carcinogen (listed under Chromium hexavalent compounds)</th>
<th>IARC: 1</th>
<th>OSHA Present</th>
<th>ACGIH A4 - Not Classifiable as a Human Carcinogen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium trioxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barium carbonate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental hazard

Ecotoxicity effects: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Toxic to wildlife and domestic animals.

Aquatic toxicity: Hexavalent chromium may remain unchanged or change slowly in many natural waters due to the low concentration of reducing matter. Hexavalent chrome in water will eventually be reduced to trivalent chrome by organic matter. The residence time of chromium in lake water has been estimated to be 4.6 to 18 years.

Mobility: This product is soluble in water. Chromium may be transported from soil through runoff and leaching of water and through aerosol formation. The organic matter present in soil is expected to reduce soluble chromate to insoluble chronic oxide.

Bioaccumulative potential: Bioaccumulation from soil to above ground parts of plants is unlikely. There is no indication of biomagnification along the terrestrial food chain (soil-plant-animal).

<table>
<thead>
<tr>
<th>Components</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium trioxide - 1333-82-0</td>
<td>96 h LC50 (Colisa fasciatus) = 40 mg/L</td>
<td></td>
</tr>
<tr>
<td>Barium carbonate - 513-77-9</td>
<td>96 h LC50 (Gambusia affinis) = 238 mg/L</td>
<td></td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION
13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Dispose of in accordance with local regulations.

Contaminated packaging: Empty containers should be taken for local recycling, recovery or waste disposal.

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14. TRANSPORT INFORMATION

**DOT (USA)**
- Proper shipping name DOT: OXIDIZING SOLID, TOXIC, N.O.S.
- Technical Name (DOT): (CHROMIUM TRIOXIDE, BARIUM CARBONATE)
- UN-No (DOT): UN3087
- Hazard Class (DOT): 5.1
- Subsidiary Class (DOT): 6.1, 8
- Packing group (DOT): II
- Description (DOT): OXIDIZING SOLID, TOXIC, N.O.S., (CHROMIUM TRIOXIDE, BARIUM CARBONATE), 5.1(6.1,8), UN3087, PGII

**TDG (Canada)**
- Proper shipping name TDG: OXIDIZING SOLID, TOXIC, N.O.S.
- Technical Name (TDG): (CHROMIUM TRIOXIDE, BARIUM CARBONATE)
- UN-No (TDG): UN3087
- Hazard Class (TDG): 5.1
- Subsidiary Class (TDG): 6.1, 8
- Packing group (TDG): II
- Description (TDG): OXIDIZING SOLID, TOXIC, N.O.S., (CHROMIUM TRIOXIDE, BARIUM CARBONATE), 5.1(6.1,8), UN3087, PGII

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15. REGULATORY INFORMATION

**International Inventories**

All of the components in this product are on or exempt from the following inventories:
- USA (TSCA), CANADA (DSL / NDSL), Europe (EINECS/ELINCS/NLP), Australia (AICS), Korea (ECL), China (IECSC), Japan (ENCS), Philippines (PICCS).
International Inventory Legend
TSCA: US - Toxic Substance Control Act
DSL: Canada - Domestic Substance List
NDSL: Canada - Non-Domestic Substance List
IECSC: China - Inventory of Existing Chemical Substances China
EINECS: EU List of Notified Chemical Substances
ELINCS: EU Inventory of Existing Commercial Chemical Substances
ECL: Korea - Existing Chemicals List
AICS: Australia - Inventory of Chemical Substances
ENCS: Japan - Existing and New Chemical Substances
PICCS: Philippines - Inventory of Chemicals and Chemical Substances

U.S. Regulations:

HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CA PROP 65</th>
<th>SARA 302</th>
<th>SARA 313</th>
<th>CERCLA RQ</th>
<th>TSCA 12(b)</th>
<th>CWC</th>
<th>DEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium trioxide</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barium carbonate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

U.S. Regulations Legend
CA PROP 65: California Proposition 65 - Carcinogens List
TSCA 12(b): TSCA Section 12(b) - Export Notification
SARA 302: CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs and TPQs
SARA 313: CERCLA/SARA - Section 313 - Emission Reporting
CERCLA RQ: CERCLA/SARA - Hazardous Substances and Their Reportable Quantities
CWC: Chemical Weapons Convention - Annex on Chemicals
DEA LISTED: DEA (Drug Enforcement Administration) - DEA Controlled, Precursors, and / or Essential Chemicals

SARA 311

<table>
<thead>
<tr>
<th>Component</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Health Hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Fire Hazard</td>
<td></td>
<td>NO</td>
</tr>
<tr>
<td>Sudden Release of Pressure Hazard</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>Reactive Hazard</td>
<td></td>
<td>NO</td>
</tr>
</tbody>
</table>

Canada
This product has been classified in accordance with the criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

WHMIS Controlled List

HAZARDOUS COMPONENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No</th>
<th>WHMIS Call out threshold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chromium trioxide</td>
<td>1333-82-0</td>
<td>0.1</td>
</tr>
<tr>
<td>Barium carbonate</td>
<td>513-77-9</td>
<td>0.1</td>
</tr>
</tbody>
</table>

WHMIS hazard class:
- C Oxidizing materials
- E Corrosive material
- D1B Toxic materials
- D2A Very toxic materials

16. OTHER INFORMATION
16. OTHER INFORMATION

NFPA: Health: 3 Flammability: 0 Instability: 1

CAREFULLY READ THE FOLLOWING: The identification of ingredients in this document meets or exceeds the requirements set forth in 29 CFR, 40 CFR, TDG et al. at the date of publication. Ingredients present in a mixture or solution which are generically identified or not referenced in this document are not regulatorily required to be specifically identified or referenced. The information contained herein should be provided to all those who will use, handle, store, transport, or may otherwise be exposed to this product.

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Prepared by: H.E.S. Department