1 Product and Company Identification:

- **Product name:** CR-7S Chromium Etchant
- **Manufacturer:**
  CYANTEK CORPORATION  
  3055 Osgood Court  
  Fremont, CA 94538  
  (510) 651-3341
- **24 Hour Emergency Telephone Number:**
  CHEMTREC: (800) 424-9300 (North America): (703) 527-3887 (Int’l.)

2 Composition/Information on Ingredients:

- **Chemical formula:** HClO4 + Ce(NH4)2(NO3)6 + Surfactant + H2O
- **Hazardous components:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percent by wt.</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceric Ammonium Nitrate</td>
<td>8%</td>
<td>16774-21-3</td>
</tr>
<tr>
<td>perchloric Acid</td>
<td>7%</td>
<td>7601-90-3</td>
</tr>
<tr>
<td>Potassium Perfluoroalkyl Sulfonates</td>
<td>&lt;1%</td>
<td>N/A</td>
</tr>
<tr>
<td>Water</td>
<td>85%</td>
<td>7732-18-5</td>
</tr>
</tbody>
</table>

3 Hazards identification

- **Hazard description:** Corrosive
- **Irritating to eyes, skin and respiratory system.**
- **Classification system**
  The classification was made from the hazardous components’ MSDS’s.

4 First aid measures

- **Inhalation:** Supply fresh air; consult doctor in case of complaint.
- **Skin contact:** Flush affected areas with plenty of water, remove contaminated clothing, get medical attention if irritation persists.
- **Eye contact:** Rinse opened eye for several minutes under running water. If irritation persists, consult a doctor.
- **Ingestion:** Give large amounts of water. Consult a doctor immediately.

5 Fire fighting measures

- **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Protective equipment** Wear goggles, rubber gloves and boots, self contained breathing apparatus, and acid protective clothing.
6 Accidental release measures

- **Personal precautions:** Wear goggles, rubber boots and gloves, and acid-protective clothing
- **Environmental precautions:** Do not allow substance to enter sewage system, surface or ground water.
- **Methods for cleaning up:** Contain the spill by diking/absorbing with liquid-binding material (sand, diatomite, acid binders, universal binders). Ensure adequate ventilation.

7 Handling and storage

Handling

- **Information for safe handling:**
  Ensure good ventilation/exhaustion at the workplace.
  Prevent formation of aerosols.
- **Information about protection against explosions and fires:**
  No special measures required.

Storage

- Store between 50 and 77 Degrees F.
- Keep containers tightly sealed
- Store away from strong caustics

8 Exposure controls and personal protection

- **Engineering controls:**
  No further data; see section 7.

**Exposure limits (threshold limit values):**

- Ceric Ammonium Nitrate: None established
- Perchloric Acid: None established
- Potassium Perfluoroalkyl Sulfonates: 1 mg/m3 (Suggested)

- **General protective and hygienic measures:**
  Keep away from foodstuffs and beverages.
  Immediately remove all soiled and contaminated clothing
  Wash hands before breaks and at the end of work.
  Avoid contact with the eyes and skin.

- **Breathing equipment:**
  In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

- **Protection of hands:** Acid resistant gloves.
- **Eye protection:** Tightly sealed goggles.
- **Body protection:** Acid resistant protective work clothing.
9 Physical and chemical properties:

- **Physical state**: Liquid
- **Color**: Orange
- **Odor**: Faint acid odor
- **Boiling point**: Undetermined
- **Flash point**: Not applicable
- **Self ignition temperature**: Not applicable
- **Danger of explosion**: Product does not present an explosion hazard.
- **Vapor pressure** at (20 °C): Unknown
- **Density** at (20 °C): 1.1 g/cm³
- **Solubility in water**: Fully soluble

10 Stability and reactivity

- **Thermal decomposition**: NOx may be generated if heated to greater than 185 degrees C.
- **Dangerous reactions**: Avoid contact with organic solvents and strong Caustics.
- **Dangerous products of decomposition**: NOx upon heating to greater than 185 degrees C. Reactive Perchlorates may be formed when heated above boiling.
- **Avoid boiling of product

11 Toxicological information

- **Acute toxicity**: Corrosive to skin, eyes, and mucous membranes
- **Primary irritant effect on the skin and eye**: Irritant
- **Sensitization**: No sensitizing effects known.

12 Ecological information:

- **General notes**: Do not allow product to reach ground water, water course or sewage system. Danger to drinking water if even small quantities leak into the ground.

13 Disposal considerations

- Do not allow product to reach sewage system.
- Dispose of product (including packagings) in accordance with applicable regulations.
14 Transportation information

- Land (CFR 49), Maritime (IMDG), Air (ICAO)
- **Class**: 8 (Corrosive Liquid)
- **UN Number**: 3264
- **Proper Shipping Name**: Corrosive liquid, acidic, inorganic n.o.s.
  (Ceric Ammonium Nitrate, Perchloric Acid)
- **Packing Group**: III

15 Regulations

- **CERCLA Hazardous Substances (with reportable quantity)**: None
- **Extremely Hazardous Substances**: None
- **Toxic Chemicals (Section 313)**: None
- **TSCA Inventory**: All ingredients on TSCA inventory
- **Proposition 65 List**: None
- **Clean Water Act Hazardous Substance List (with reportable quantity)**: None
- **Clean Air Act Synthetic Organic Chemical (CAA SOCMI)**: None
- **Clean Air Act Accidental Release Prevention Substance, section 112 r (with threshold quantity)**: None
- **PSM Highly Hazardous Chemical List (with threshold quantity)**: Perchloric Acid (500 #)

- **Safety phrases**:
  - Do not breathe fumes.
  - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
  - Wear suitable protective clothing.
  - In case of accident seek medical advice immediately.

16 Other information:

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.