


1. Chemical Product and Company Identification

Trade Name: NYACOL[®] ZRO2(AC)
 Chemical Name: Zirconium Oxide, Acetic Acid
 Synonyms: None
 Product Code: ZRO2(AC)
 Use: Ceramics
 Manufacturer: Nyacol Nano Technologies, Inc.
 Megunko Road, P.O. Box 349, Ashland, MA 01721 U.S.A.
 Emergency Telephone: 508-881-2220
 E-mail Contact: info@nyacol.com

2. Hazard Identification

Emergency Overview Translucent liquid. Vinegar odor. Keep spills out of surface waters.
Classification Irritant. 10 wt % <Acetic Acid Concentration <25 wt %
Symbol: 
Risk Phrases: R36/38 Irritating to eyes and skin.
Safety Phrases: S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.
 S28 In case of contact with skin, wash immediately with plenty of soap and water.

Potential Health Effects / Health Hazard Identification

Acute Exposure:
 Eye: Irritant.
 Skin: Irritant, drying or cracking of skin due to drying effect.
 Ingestion: Not known.
 Inhalation: Not known.
Chronic Exposure: Not known.

Other Hazards

Known Synergists: Not available.
Explosion Hazard: Not available.
Fire Hazard: Not available.
Corrosion Hazard: Not available.

3. Composition / Information on Ingredients

<u>Component</u>	<u>CAS #</u>	<u>Exposure Limits</u>	<u>Percent By Weight</u>
Zirconium Oxide:	1314-23-4	5mg/M ³ TWA	20
Acetic Acid:	64-19-7	10 ppm TWA	15
Water:	7732-18-5	None	65

<u>Component</u>	<u>EINECS #</u>	<u>RTECS #</u>	<u>REACH #</u>
Zirconium Oxide:	215-227-2	ZH8800000	05-2117294598-22-0000
Acetic Acid:	200-580-7	AF1225000	05-2117294607-31-0000
Water:	231-791-2	ZC0110000	None.

4. First Aid Measures

Eye Contact: Flush eyes with large quantities of water. If irritation persists get medical attention.
Skin Contact: Wash well with soap and water.

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4. First Aid Measures, continued

Ingestion: If swallowed seek medical attention immediately. Do not induce vomiting. Give large quantities of water with Milk of Magnesia or other medical antacid. Never give anything by mouth to an unconscious person.

Inhalation: Remove person from exposure source. Seek medical professional.

First Aid Facilities: Eye wash station. Milk of Magnesia or other medical antacid.

Advice to Physicians: None available.

5. Firefighting Measures

Flammability: Material will not burn in a fire. Containers can build pressure if exposed to heat or fire.

Extinguishing Media: All are acceptable. Cool containers with water spray.

Protective Equipment: Wear standard full firefighter turn out gear (full bunker gear) and respiratory protection (SCBA).

Special Exposure Hazard: None known.

6. Accidental Release Measures

Leaks and Spills: Contain spill or leak with sand, clay or absorbents. Recover liquid for recycle or disposal. Do not allow spills into sewers or surface waters. Place absorbents, waste products and contaminated soil into containers for disposal.

Personal Protection: Wear eye protection and impervious gloves. An approved air-purifying respirator should be worn if dust or mist is present.

7. Handling and Storage

Handling: Avoid generating mist or dust during use.

Storage: Store in cool dry area. Do not freeze.

8. Exposure Controls / Personal Protection

Engineering Control: Use exhaust ventilation to keep airborne concentrations below exposure limits.

Respiratory Protection: When respiratory protection required or concentrations unknown use approved air-purifying respirator equipped with dust cartridge.

Skin Protection: Clean body-covering clothing, impervious gloves such as neoprene.

Eye Protection: Wear approved safety glasses.

9. Physical and Chemical Properties

Appearance: Translucent liquid

Odor: Vinegar

Physical State: Liquid. NYACOL ZRO2(AC) is a water-based material.

pH: 3 - 4

Boiling Point: 100°C (212°F) water

Freezing Point: 0°C (32°F) water

Flash Point: Not applicable.

Vapor Pressure: 2260 kPs (17 mm Hg) at 20°C water

Oxidizing Properties: Not an oxidizer.

Solubility in Water: Soluble in all proportions.

Density: 1260 Kg/M³

Specific Gravity: 1.26

Volatile by Weight: 80 %

Viscosity: <15 cP

Explosion Limits: Not applicable.

Partition Coefficient: Not available.

Evaporation Rate: Slow (Butyl Acetate = 1)

10. Stability and Reactivity

Chemical Stability:	Stable.
Conditions To Avoid:	Neutralization by basic materials.
Incompatibility With Other Materials	Not available.
Hazardous Decomposition Products:	Acetic Acid, Carbon Monoxide, Carbon Dioxide
Hazardous Polymerization:	Will not occur.

11. Toxicological Information

<u>Material</u>	<u>LD₅₀, Rat, Oral</u>
Zirconium Oxide	> 8800 mg/kg
Acetic Acid	3310 mg/kg
Water	None reported.
Eye Effects:	Not available.
Skin Effects:	Not available.
Inhalation Effects:	Not available.
Ingestion Effects:	Not available.

12. Ecological Information

Ecotoxicity:	Not available.
Persistence:	Not available.

13. Disposal Considerations

Disposal Considerations:	Recycle or solidify for disposal in a landfill approved for chemical waste.
United States:	Not an RCRA-regulated waste.

14. Transport Information

<u>Regulations</u>	<u>Shipping Name</u>	<u>Hazard Class</u>	<u>Packing Group</u>	<u>U.N. Number</u>
U.S. D.O.T.:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
ICAO / IATA:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
IMO / IMDG:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
ADR:	Not applicable.	Not applicable.	Not applicable.	Not applicable.

15. Regulatory Information


<u>U.S. Federal Regulations</u>	
EPA TSCA Inventory:	All ingredients listed.
SARA Section 313:	No ingredients listed.
D.O.T. Regulations:	See Section 14.

<u>U.S. State Regulations</u>	
California Proposition 65:	No ingredients listed.
State Right-to-Know Laws:	Section 2 of this MSDS lists all components of ZRO2(AC).

<u>Canadian Regulations</u>	
Domestic Substance List:	All ingredients listed.
WHMIS:	Class E
Transportation of Dangerous Goods:	Does not meet dangerous goods criteria.
Controlled Products Regulations:	This MSDS contains all the information items specified in Schedule 1, Column 3 of the Controlled Products Regulations in a 16-heading format.

15. Regulatory Information, continued

EC Regulations

Classification: Harmful. 10 wt % <Acetic Acid Concentration <25 wt %
Symbol:  Xn
Risk Phrases: R36/38 Irritating to eyes and skin.
Safety Phrases: S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.
S28 In case of contact with skin, wash immediately with plenty of soap and water.

16. Other Information

NFPA 704 Hazard Rating: Health - 1, Flammability - 0, Reactivity - 0, Special - None.
HMIS[®] Hazard Rating: Health - 1, Flammability - 0, Reactivity - 0
Protective Equipment - B: Eye Protection, Gloves
Recommended Use: ZRO2(AC) is recommended for use in ceramics. Other uses have not been investigated and may have other hazards. For industrial use only, not for food, drug or home use.
Work Alert: Workers using ZRO2(AC) should read and understand this MSDS and be trained in the proper use of this material.
MSDS Prepared By: David L. Catone
Technical Service and Product Development Manager
R&D Department
Nyacol Nano Technologies, Inc.
Telephone: 508-881-2220 U.S.A.
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