

1. Chemical Product and Company Identification

Trade Name: NYACOL® Y2O3
Chemical Name: Yttrium Oxide
Synonyms: Colloidal Yttria, Colloidal Yttrium Oxide, Yttria
Product Code: Y2O3
Use: Ceramics, Catalysts
Manufacturer: Nyacol Nano Technologies, Inc.
Megunko Road, P.O. Box 349, Ashland, MA 01721 U.S.A.
508-881-2220
Emergency Telephone: CHEMTREC: 800-424-9300
E-mail Contact: info@nyacol.com

2. Composition / Information on Ingredients

<u>Component</u>	<u>CAS #</u>	<u>Exposure Limits</u>	<u>Percent By Weight</u>
Yttrium Oxide:	1314-36-9	1 mg/M ³ (Yttrium)	14
Acetic Acid:	64-19-7	10 ppm TWA	9
Water:	7732-18-5	None.	77

<u>Component</u>	<u>EINECS #</u>	<u>RTECS #</u>	<u>REACH #</u>
Yttrium Oxide:	215-233-5	ZG3850000	05-2117294609-27-0000
Acetic Acid:	200-580-7	AF1225000	05-2117294607-31-0000
Water:	2317912	ZC0110000	None.

3. Hazard Identification

Emergency Overview Translucent liquid. Vinegar odor. Keep spills out of surface waters.

Classification Not harmful.

Symbol: None.

Risk Phrases: None.

Safety Phrases: None.

Potential Health Effects / Health Hazard IdentificationAcute Exposure:

Eye: Irritation.

Skin: Irritation.

Ingestion: Not available.

Inhalation: Not available.

Chronic Exposure: Not available.

Other Hazards

Known Synergists: None known.

Explosion Hazard: None known.

Fire Hazard: None known.

Corrosion Hazard: None known.

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.

Ingestion: If swallowed seek medical attention immediately. If medical attention is not available induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Remove person from exposure source, consult medical professional.

First Aid Facilities: Eye wash station. Syrup of Ipecac.

Advice to Physicians: None available.

5. Firefighting Measures

Flammability: 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: 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 odor
Physical State: Liquid. NYACOL® Y2O3 is a water-based material.
pH: 6 - 7
Boiling Point: 100°C (212°F) water
Freezing Point: 0°C (32°F) water
Flash Point: None.
Vapor Pressure: 2260 kPa (17 mm Hg) at 20°C water
Oxidizing Properties: Not an oxidizer
Solubility in Water: Soluble in all proportions
Density: 1200 Kg/M³
Specific Gravity: 1.2 (water = 1)
Volatile by Weight: 86 %
Viscosity: Not available.
Explosion Limits: Not applicable.
Partition Coefficient: Not available.
Evaporation Rate: Slow (Butyl Acetate = 1)

10. Stability and Reactivity

Chemical Stability: Stable under normal ambient and anticipated storage and handling conditions.
Conditions To Avoid: None known.
Incompatibility With Other Materials: None known.
Hazardous Decomposition Products: Acetic Acid.
Hazardous Polymerization: Will not occur.

11. Toxicological Information

<u>Material</u>	<u>LD₅₀, Rat, Oral</u>
Yttrium Oxide:	Greater than 10gm/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 a 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.S. Federal Regulations

EPA TSCA Inventory:	All ingredients listed.
SARA Section 313:	No ingredients listed.
D.O.T. Regulations:	See Section 14.

U.S. State Regulations

California Proposition 65:	No ingredients listed.
State Right-to-Know Laws:	Section 2 of this MSDS lists all components of Y2O3.

Canadian Regulations

Domestic Substance List:	All ingredients listed.
WHMIS:	Not a hazardous substance.
Transportation of Dangerous Goods:	Not applicable. 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.

EC Regulations

Classification:	Not harmful.
Symbol:	None.
Risk Phrases:	None.
Safety Phrases:	None.

16. Other Information

NFPA 704 Hazard Rating: Health - 0, Flammability - 0, Reactivity - 0, Special - None
HMIS* Hazard Rating: Health - 1, Flammability - 0, Reactivity - 0
Protective Equipment - B: Safety Glasses and Gloves
Recommended Use: Y2O3 is recommended for use in ceramics or catalysts.
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 Y2O3 should read and understand this MSDS and be trained in the proper use of this material.
MSDS Prepared By: Dr. David L. Catone
Technology Service and Product Development Manager
R&D Department
Nyacol Nano Technologies, Inc.
Telephone: 508-881-2220 U.S.A.
Revision Date: August 22, 2012
Supersedes: November 11, 2010

Information herein is accurate to the best of our knowledge. Suggestions are made without warranty or guarantee of results. Before using, the user should determine the suitability of the products for the intended use, and the user assumes the risk and liability in connection therewith. We do not suggest violation of any existing patents or give permission to practice any patented invention without license.

NYACOL® is a registered trademark of Nyacol Nano Technologies, Inc.