

Section 1: Product and Company Identification:

1.1 Product Identifier

Product Form: Mixture
 Identification of Substance: Yttrium Oxide
 Product Name: NYACOL® Y2O3
 Synonym: Colloidal Yttria, Colloidal Yttrium Oxide, Yttria
 CAS Number: 1314-36-9
 Index Number: Not available.
 EINECS Number: 215-233-5
 REACH Registration Number: 05-2117294609-27-0000
 Formula: Y₂O₃

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use: Ceramics. Catalysts.
 Restrictions on Use: For industrial use only, not for food, drug or home use.

1.3 Details of the supplier of the safety data sheet

Company Identification: Nyacol Nano Technologies, Incorporated
 Megunko Road, P.O. Box 349, Ashland, MA 01721 U.S.A.
 508-881-2220
 Email Contact: info@nyacol.com
 Internet: www.nyacol.com

1.4 Emergency telephone number

In Case of Emergency: CHEMTREC: 1-800-424-9300
 International CHEMTREC: +1 (703) 527-3887
 24 Hours/Day: 7 Days/Week

Section 2: Hazard(s) Identification

2.1 Classification of the substance or mixture

GHS-US Classification

Not classified.

2.1.1 Classification according to Regulation (EC) No. 1272/2008 (CLP)

Not classified.

2.1.2 Classification according to Directive 67/548/EEC and 1999/45/EC (including amendments)

Not classified.

2.2 Label Elements – Labelling according to Regulation (EC) No. 1272/2008

Not labelled.

Signal Word: Not applicable.

Hazard Pictogram: Not applicable.

Hazard Statement(s): Not applicable.

Precautionary Statement(s): Not applicable.

2.3 Other Hazards

Components do not meet the criteria for a PBT or vPvB substance.

2.4 Unknown acute toxicity (GHS US)

No further relevant information available.

Section 3: Composition / Information on Ingredients

3.1 Chemical characterization: Mixtures

Description: Mixture consisting of the following components.

Hazardous Component Name:	Product Identifier	Classification	Percent By Weight
Acetic acid: REACH: 05-2117294607-31-0000	CAS: 64-19-7 EINECS: 200-580-7 Index: Not available	Not classified at a concentration of less than 10%.	9
Non-hazardous Component Name:	Product Identifier	Classification	Percent By Weight

Yttrium oxide: REACH: 05-2117294609-27-0000	CAS: 1314-36-9 EINECS: 215-233-5 Index: Not available	Not classified.	14
Water:	CAS: 7732-18-5 EINECS: 231-791-2 Index: Not available	Not classified.	77

Impurities: Present at a level below that to be taken into account for classification.

Stabilizing Additives: None

The supplier currently has no knowledge on additional ingredients that are classified and that contribute to the classification of this substance.

Section 4: First-Aid Measures

4.1 Description of first aid measures

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of the eye and lids with water. Get medical attention.

Skin Contact: In case of contact, immediately flush skin with plenty of water for several minutes. Remove contaminated clothing. Get medical attention if skin irritation develops or persists.

Inhalation: If inhaled, remove to fresh air; remove person from exposure source. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen. Consult medical professional.

Ingestion: If swallowed, rinse out mouth with water and seek medical attention. Never give anything by mouth to an unconscious person.

First Aid Facilities: Eye wash station.

Advice to Physicians: No further relevant information available.

4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed.

No further relevant information available.

Section 5: Fire-Fighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media: Use fire fighting measures that suit the environment. All are acceptable, cool containers with water spray.

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture

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

Special Hazard Arising from the Chemical: No further relevant information available.

Fire Hazard: No further relevant information available.

Explosion Hazard: No further relevant information available.

Reactivity: No further relevant information available.

5.3 Advice for firefighters

Special Protective Equipment for Fire-fighters: Wear standard full firefighter turn-out gear (full bunker gear) and respiratory protection (SCBA).

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Personal Precautions and PPE:

Wear protective equipment; eye protection and impervious gloves.
 Keep unprotected persons away. An approved air-purifying respirator should be worn if dust or mist is present.

6.2 Environmental precautions

Water contamination should be avoided.

6.3 Methods and material for containment and cleaning up

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. 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. Avoid contact with skin, eyes or clothing.

6.4 Reference to other sections

For more information on exposure controls and personal protection or disposal considerations, check section 8 and 13 of this SDS.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Minimum feasible handling and temperatures should be maintained. Avoid generating mist or dust during use. Use only in well ventilated area.

7.1.1 Protective measures

Use only in well ventilated areas. As a precautionary measure, the wearing of standard work gear is suggested. Keep ignition sources away. Do not smoke. Protect from heat.

7.1.2 Advice on general occupational hygiene

Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure a safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no eating, drinking and smoking at the workplace and wearing standard working clothes and shoes unless otherwise stated. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home.

7.2 Conditions for safe storage, including any incompatibilities

Periods of exposure to high temperatures should be minimized. Provide sufficient ventilation in storage and workrooms. Keep from freezing. Store in a cool dry area. Keep containers tightly sealed.

7.3 Specific end use(s)

No additional information available. Refer to Section 1.2 of this SDS.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters
8.1.1 National Limit Values

Yttrium oxide, CAS #1314-36-9

USA OSHA	OSHA PEL Ceiling (mg/M ³)	1 mg/M ³ (Yttrium)
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Acetic acid, CAS #64-19-7

USA OSHA	OSHA PEL Ceiling (mg/M ³)	10 ppm TWA
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8.2 Exposure Controls
8.2.1 Appropriate Engineering Controls

Use exhaust ventilation to keep airborne concentrations below exposure limits.

8.2.2 Individual protective measures, such as personal protective equipment (PPE)
Hygiene Measures:

Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

Respiratory:	Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air-supplied respirators should always be worn when airborne concentrations of the contaminant or oxygen content is unknown.
Hands:	Wear impervious gloves such as neoprene.
Eyes:	Safety glasses, chemical type goggles, or face shield recommended to prevent eye contact.
Skin:	Wear clean body-covering clothing; impervious gloves such as neoprene. Workers should wash exposed skin several times daily with soap and water. Soiled work clothing should be laundered or dry-cleaned.

8.2.3 Environmental Exposure Controls

Adverse effects of this material on the environment have not been evaluated. Proper disposal techniques to isolate and recover material should be implemented.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance (Physical State, Color):	Liquid. Translucent. NYACOL Y2O3 is a water-based material.
Upper/lower flammability or explosive limits:	Not available.
Volatile by Weight:	86%
Odor:	Vinegar odor.
Vapor Pressure:	2260 kPa (17 mm Hg) at 20° C water.
Odor Threshold:	Not available.
Vapor Density:	Not available.
pH:	6 – 7
Density:	1,200 Kg/M ³
Solubility in Water:	Soluble in all proportions.
Initial boiling point and boiling range:	100°C (212°F) water
Flashpoint:	None.
Evaporation Rate:	Slow (Butyl Acetate = 1)
Flammability (solid, gas):	Material will not burn in a fire.
Partition Coefficient:	Not available.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
Viscosity:	Not available.
Specific Gravity:	1.2 (water = 1)
Freezing Point:	0° C (32° F) water
Explosion Limits:	Product is not explosive.
Oxidizing Properties:	Not an oxidizer.

9.2 Other information

No further relevant information available.

Section 10: Stability and Reactivity

10.1 Reactivity

No further relevant information available.

10.2 Chemical Stability

Stable under normal ambient and anticipated storage and handling conditions.

10.3 Possibility of hazardous reactions

No further relevant information available.

10.4 Conditions to avoid

No further relevant information available.

10.5 Incompatible materials

No further relevant information available.

10.6 Hazardous decomposition products

Acetic acid, carbon monoxide, carbon dioxide.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Yttrium oxide, CAS# 1314-36-9

Acute toxicity: **Oral:** LD50 Rat >10 gm/Kg

Acetic acid, CAS# 64-19-7

Acute toxicity: **Oral:** LD50 Rat 3310 gm/Kg

Skin Contact: Irritant. Avoid contact with skin.

Eye Contact: Irritant. Avoid contact with eyes.

Inhalation: Use breathing protection when aerosol or mist is formed.

Sensitization: No further relevant information available.

Chronic Effects: No further relevant information available.

Carcinogenicity: No data indicating any concern for carcinogenicity.

Section 12: Ecological Information

12.1 Toxicity

Aquatic toxicity:

No further relevant information available.

12.2 Persistence and degradability

There is no data on the degradability of this product.

12.3 Bioaccumulative potential

No further relevant information available.

12.4 Mobility in soil

No further relevant information available.

12.5 Results of PBT and vPvB Assessment

The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to this product.

12.6 Other adverse effects

No further relevant information available.

Section 13: Disposal Considerations

This information presented only applies to the materials as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

13.1 Waste treatment methods

Y2O3 disposal must be in accordance with location/national regulations.

In the United States Y2O3 is not a RCRA-regulated waste.

Section 14: Transport Information

NYACOL Y2O3 is not restricted for transportation.

14.1 UN Number:

Not applicable.

14.2 UN Proper Shipping Name:

Not applicable.

14.3 Transport hazard class(es) / 14.4 Packing Group:

Regulations	Shipping Name	Hazard Class	Packing Group	UN Number
U.S. D.O.T.:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
IMO/IMDG:	Not applicable.	Not applicable.	Not applicable.	Not applicable.

ICAO/IATA:	Not applicable.	Not applicable.	Not applicable.	Not applicable.
ADR:	Not applicable.	Not applicable.	Not applicable.	Not applicable.

14.5 Environmental hazards:

No further relevant information available.

14.6 Special precautions for users:

No further relevant information available.

14.7 Transport bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for substance or mixture:

Worldwide Chemical Inventories

EINECS (EU):	All ingredients conform.
EPA TSCA (USA):	All ingredients listed.
Domestic Substance List (Canada):	All ingredients listed.
WHMIS:	Not a hazardous substance.
Controlled Products Regulations:	This SDS contains all the information items specified in Schedule 1, Column 3 of the Controlled Products Regulations in a 16-heading format.
Transportation of Dangerous Goods (TDG):	Y2O3 does not meet dangerous goods criteria.
State Right-to-Know Laws:	Section 3 of this SDS lists all components of Y2O3.
California Proposition 65:	No ingredients listed.
SARA 313:	No ingredients listed.
SARA Codes:	CAS #64-19-7: acute, chronic, flammable.

15.2 Chemical safety assessment:

A Chemical Safety Assessment has not been carried out.

Section 16: Other Information

Full text for relevant hazard phrases from section 2 and 3

Not applicable.

National Fire Protection Association (U.S.A.)	Health-0, Flammability-0, Reactivity-0, Special-None
HMIS® Hazard Rating:	Health-1, Flammability-0, Reactivity-0, Protective Equipment - B; safety glasses, gloves.
Recommended Use:	NYACOL 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 NYACOL Y2O3 should read and understand this SDS and be trained in the proper use of this material.
Other Special Considerations:	None known.
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