

Section 1: Product and Company Identification:

1.1 Product Identifier

Product Form: Mixture
 Identification of Substance: Cesium tungsten oxide
 Product Name: NYACOL[®] CTO-W
 Synonym: CTO, dopedcesium tungsten oxide
 CAS Number: 52350-17-1
 Index Number: Not available.
 EINECS Number: 466-380-9
 REACH Registration Number: In accordance with Article 2 (7)(c) of REACH, registration of this substance is not required.
 Formula: Cs_{0.33}WO₃

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

Recommended Use: IR asborber. Polymer additive.
 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.
 +1 508-881-2220
 Email Contact: info@nyacol.com
 Internet: www.nyacol.com

1.4 Emergency telephone number

In Case of Emergency: USA/Canada CHEMTREC: +1 (703) 527-3887
 International CHEMTREC: +1 (703) 741-5970
 24 Hours/Day: 7 Days/Week

Section 2: Hazard(s) Identification

2.1 GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Not classified.

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

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

Description: Mixture consisting of the following components.

Component Name:	Product Identifier	GHS Classification	Percent By Weight
Cesium tungsten oxide:	CAS: 52350-17-1 EINECS: 466-380-9 Index: Not available	Not classified	10

Water	CAS: 7732-18-5 EINECS: 231-791-2 Index: Not available	Not classified	90
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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.

See Section 16 for a list of hazards if identified above.

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. Do not allow victim to rub eyes or keep eyes closed. Get medical attention.

Skin Contact: Wash skin with plenty of soap and water for several minutes. Get medical attention if skin irritation develops or persists.

Inhalation: Remove person from exposure source and to fresh air. Get medical attention immediately. If not breathing, clear person's airway and give artificial respiration. If breathing is difficult, qualified medical personnel may administer oxygen.

Ingestion: If a person is conscious and can swallow, immediately give two glasses of water (16 oz. or 500 ml.) but do not induce vomiting. If vomiting occurs, give fluids again. Do not give anything by mouth to an unconscious or convulsing person. Get medical attention.

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

Acute or delayed effects are not anticipated.

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

Treat symptomatically.

Section 5: Fire-Fighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media: All are suitable. Use water spray, dry chemical, foam or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

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

Eye protection and impervious gloves. An approved air-purifying respirator should be worn if vapor or mist is present.

6.1.1 For non-emergency personnel

Wear protective equipment. Keep unprotected persons away. Avoid contact with skin and eyes.

6.2 Environmental precautions

Prevent entry into sewers and waterways.

6.3 Methods and material for containment and cleaning up

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. 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. An approved air-purifying respirator should be worn if dust or mist is present. Keep ignition sources away. Do not smoke.

7.1.2 Advice on general occupational hygiene

Avoid inhalation, ingestion and contact with eyes. 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

Keep from freezing. Provide sufficient ventilation at store and workrooms. Store in cool, dry area. Periods of exposure to high temperatures should be minimized.

7.3 Specific end use(s)

No further relevant information available. Refer to Section 1.2 of this SDS.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters

Tungsten and compounds (insoluble):

USA OSHA	OSHA PEL Ceiling (mg/m ³)	5 mg/m ³ as W Short term exposure: 10 mg/m ³ as W 15-minute reference period.
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8.2 Exposure Controls

Engineering Controls:	Ventilation adequate to meet occupational exposure limits.
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.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance (Physical State, Color):	Dark blue liquid.
Upper/lower flammability or explosive limits:	Not determined.
Volatile by Weight:	90%
Odor:	Odorless
Vapor Pressure:	17 mm Hg at 20°C
Odor Threshold:	Not determined.
Vapor Density:	Not determined.
pH:	5
Relative Density:	1100 kg/m ³
Melting point/freezing point:	Not determined.
Solubility in Water:	Not soluble.
Initial boiling point and boiling range:	100° C (212° F)
Flashpoint:	None
Evaporation Rate:	Slow (Butyl Acetate = 1)
Flammability (solid, gas):	Material will not burn in a fire.
Partition Coefficient:	Not determined.
Auto-ignition temperature:	Not determined.
Decomposition temperature:	Not determined.
Viscosity:	<10 cP
Specific Gravity:	1.1
Freezing Point:	0°C (32° F)
Explosion Limits:	Not applicable.
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.

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

Not determined.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity: LD50: >2000 mg/kg (oral, rat)
Skin corrosion/irritation: Avoid contact with skin. May cause mild skin irritation.
Eye damage/irritation: Avoid contact with eyes. May cause mild eye irritation.
Inhalation: No further relevant information available.
Ingestion: No further relevant information available.
Sensitization: No further relevant information available.
Carcinogenicity: No data indicating any concern for carcinogenicity.

Section 12: Ecological Information

12.1 Aquatic Toxicity

No further relevant information available.

12.2 Persistence and degradability

No further relevant information available.

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

No further relevant information available.

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.

Disposal Considerations: The product should be recycled or solidified for disposal in an approved landfill.

United States: The product is not a RCRA regulated waste.

Section 14: Transport Information

The product is not restricted for transportation.

Sections 14.1 – 14.4

Regulations

U.S. D.O.T.: Not regulated.

ICAO/IATA: Not regulated.

IMO/IMDG: Not regulated.

ADR: Not regulated.

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, the product is not sold in bulk quantities.

Section 15: Regulatory Information

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

EPA TSCA Inventory:	All ingredients listed.
State Right-to-Know Laws:	Section 3 of this SDS lists all components of the product.
SARA Section 311/312 (40 CFR 370) Hazard:	Not classified according to GHS.
SARA Section 313:	No ingredients listed.
California Proposition 65:	No ingredients listed.

15.2 Chemical safety assessment:

A Chemical Safety Assessment has not been carried out.

Section 16: Other Information

National Fire Protection Association (U.S.A.) 704
HMIS[®] Hazard Rating: Health-1, Flammability-0, Reactivity-0, Special-None
Health-1, Flammability-0, Reactivity-0, Protective Equipment - E;
safety glasses, dust respirator.

Recommended Use: The product is recommended for use as a catalyst, in ceramics and polymers. 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 the product should read and understand this SDS and be trained in the proper use of this material.

Other Special Considerations: None known.

SDS Prepared By: Andrew Guzelian
Nyacol Nano Technologies, Incorporated
Telephone: 508-881-2220 U.S.A.

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This SDS has been prepared with data from Nyacol Nano Technologies, Inc.'s laboratories, raw material suppliers, and government publications. 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.

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