

MATERIAL SAFETY DATA SHEET

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NANOCOMPOSIX CUSTOMER SERVICE:
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POISON CENTER:

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SECTION 1 Product Identification

CHEMICAL NAME: Titanium dioxide nanorods, Colloidal (0.9–1.1 % in n-butanol)

PRODUCT NUMBER: CUSTOM

CAS REGISTRY NUMBER: 13463-67-7

FORMULA: TiO₂

EINECS NUMBER: 215-280-1

CHEMICAL FAMILY: metal oxide

SYNONYM: Titania, Titanium(IV) oxide, in n-butyl alcohol

SECTION 2 Composition and Information on Ingredients

MSDS MATERIAL	CAS #	%	ACGIH (TWA)	OSHA (PEL)
Titanium dioxide, Colloidal	13463-67-7	0.9-1.1%	10 mg/m ³	10 mg/m ³
n-Butanol	71-36-3	>98%	20 ppm	150 mg/m ³ ; 50 ppm

SECTION 3 Hazards Identification

EMERGENCY OVERVIEW: Irritating to skin, eyes, and respiratory system. Inhalation of n-butanol vapor may cause coughing, headache, dizziness, and drowsiness and severely irritate the eyes. Mutagenic effects: butanol; mutagen.

PRIMARY ROUTES OF EXPOSURE: Ingestion, inhalation, skin, eyes

EYE CONTACT: N-butanol vapor may cause severe irritation of the eyes.

SKIN CONTACT: Liquid causes mild irritation of the skin.

INHALATION: Harmful by inhalation. May cause coughing, laryngitis, shortness of breath, headache, dizziness, weakness and drowsiness.

INGESTION: Harmful if swallowed. Ingestion may cause gastrointestinal distress, nausea, vomiting and headache.

ACUTE HEALTH EFFECTS: Irritating to skin, eyes and respiratory tract. N-Butanol causes severe eye irritation, drowsiness, and gastrointestinal distress.

CHRONIC HEALTH EFFECTS: N-butanol: reproductive effects have been observed in animal studies. N-butanol: mutagenic effects.

NTP: No

IARC: No

OSHA: No

SECTION 4 First Aid Measures

EYE EXPOSURE: Immediately flush the eyes with extensive amounts of water for at least 15 minutes. A victim may need assistance with keeping their eye lids open. Get immediate medical attention.

SKIN EXPOSURE: Wash the affected area with water. Remove contaminated clothes if necessary. Seek medical assistance if irritation persists.

INHALATION: Remove the victim to fresh air. Closely monitor the victim for signs of respiratory problems, such as difficulty in breathing, coughing, wheezing, or pain. In such cases seek immediate medical assistance.

INGESTION: Seek medical attention immediately. Keep victim calm. Give the victim water or milk (only if conscious).

SECTION 5 Fire Fighting Measures

GENERAL INFORMATION: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. If involved in a fire, this material may emit toxic organic fumes. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire.

EXTINGUISHING MEDIUM: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. For large fires, use water spray, fog, or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. Do NOT use straight streams of water.

FLASH POINT: 38.3 °C (101 °F)

AUTO IGNITION TEMPERATURE: 342 °C

EXPLOSION LIMITS: 1.4 (lower) – 1.0 (upper) % vol

NFPA RATING: (estimated) Health 1; Flammability: 3; Instability: 0

SECTION 6 Accidental Release Measures

GENERAL INFORMATION: Use proper personal protective equipment as indicated in Section 8.

SPILL AND LEAK PROCEDURES: Small spills can be mopped up with inert material then placed in suitable container. Remove all sources of ignition. Provide ventilation

SECTION 7 Handling and Storage

HANDLING: Wash thoroughly after handling. Use only in a well-ventilated area. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Avoid contact with heat, sparks and flame. Avoid ingestion and inhalation. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

STORAGE: Store in a tightly closed or sealed container at room temperature. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances.

SECTION 8 Exposure Controls and Personal Protection

ENGINEERING CONTROLS: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

EYE PROTECTION: Always wear approved safety glasses when handling a chemical substance in the laboratory.

SKIN PROTECTION: Wear protective clothing and gloves to prevent skin exposure.

VENTILATION: If possible, handle the material in an efficient fume hood. Do not use in unventilated area.

RESPIRATOR: Make sure to use an appropriate filter when using a respirator.

ADDITIONAL PROTECTION: No additional protection required

SECTION 9 Physical and Chemical Properties

COLOR AND FORM: opaque, white colloidal solution

MOLECULAR WEIGHT: 79.87

FREEZING/MELTING POINT (°C) : -89.8 °C

BOILING POINT (°C) : 117.7 °C

VAPOR PRESSURE: 6 mm Hg @ 20 °C

SPECIFIC GRAVITY: 0.81 @ 20 °C

ODOR: Strong solvent odor

SOLUBILITY IN WATER: Slightly soluble

SECTION 10 Stability and Reactivity

STABILITY: Air and moisture stable colloid.

HAZARDOUS POLYMERIZATION: no hazardous polymerization

COMBUSTIONS TO AVOID: Incompatible materials, ignition sources, excess heat, oxidizers

INCOMPATIBILITY: Crystalline titania is incompatible with hydrofluoric acid, fluorine, chlorine trifluoride or oxygen difluoride. Other: see n-butanol.

DECOMPOSITION PRODUCTS: Carbon dioxide, carbon monoxide, organic vapors and carbonates.

SECTION 11 Toxicological Information

RTECS DATA: TiO₂: orl (rat) LD50:>10000 mg/kg, skn (rbt) LD50:>10000 mg/kg. n-butanol: draize (rbt): 405 mg/24h, moderate; orl (rat) LD50:790 mg/kg; inhalation (rat) LC50:8000 ppm/4h; intraperitoneal (rat) LD50:1122 mg/kg; intravenous (rat) LD50:310 mg/kg; oral (mus) LD50:2680 mg/kg; intraperitoneal (mus) LD50:254 mg/kg; scu (mus) LD50:3200 mg/kg; ivn (mus) LD50:377 mg/kg; orl (rbt) LD50:3484 mg/kg; skn (rbt) LD50:3400 mg/kg; inhalation (mam) LC50:28400 mg/m³; orl (bwd) LD50:2500 mg/kg.

CARCINOGENIC EFFECTS: no data available

MUTAGENIC EFFECTS: N-butanol: mutagen.

TETRATOGENIC EFFECTS: N-butanol: reproductive effector.

SECTION 12 Ecological Information

ECOLOGICAL INFORMATION: No data available

SECTION 13 Disposal Considerations

DISPOSAL: Dispose of according to local, state and federal regulations.

SECTION 14 Transportation Information

SHIPPING NAME (CFR) : Butanols

HAZARD CLASS (CFR) : 3

ADDITIONAL HAZARD CLASS (CFR): NA

PACKING GROUP (CFR) : III

UNID NUMBER (CFR) : UN# 1120

SHIPPING NAME (IATA) : Butanols

HAZARD CLASS (IATA) : 3

ADDITIONAL HAZARD CLASS (IATA) NA

PACKING GROUP (IATA): III

UNID NUMBER (IATA) UN# 1120

SECTION 15 Regulatory Information

TSCA: Listed.

SARA (TITLE 313): Not listed

SECOND INGREDIENT: Butanol (CAS# 71-36-3): listed in TSCA and SARA.

THIRD INGREDIENT: none

SECTION 16 Other Information

DISCLAIMER: The information herein is believed to be accurate and reliable as of the date compiled. However, nanoComposix, Inc. makes no representation, warranty, or guarantee of any kind with respect to the information contained in this document or any use of the product based on this information.

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