

MWCNTs Isopropanol Dispersion

US Research Nanomaterials, Inc.

Material Safety Data Sheet

acc. to OSHA and ANSI

1 Identification of substance:

- **Trade name:** MWCNTs Isopropanol Dispersion
- **Stock number:**
- **Manufacturer/Supplier:**
US Research Nanomaterials, Inc.
3302 Twig Leaf Lane
Houston, Texas 77084, USA
www.us-nano.com

2 Composition/Data on components:

- **Chemical characterization:**
Description: (CAS#)

MWCNTs (CAS# 99685-96-8), 3wt%
Isopropanol (CAS# 67-63-0), 97wt%
- **Identification number(s):**
- **EINECS Number:** 215-609-9 (MWCNTs); 200-661-7 (2-propanol)

3 Hazards identification

- **Hazard description:** Appearance: Black liquid. Flash Point: 12 deg C. May cause central nervous system depression. May form explosive peroxides.
Flammable liquid and vapor. Hygroscopic. Causes respiratory tract irritation. Aspiration hazard if swallowed. Can enter lungs and cause damage. This material has been reported to be susceptible to autoxidation and therefore should be classified as peroxidizable. Causes eye irritation. Breathing vapors may cause drowsiness and dizziness. Prolonged or repeated contact causes defatting of the skin with irritation, dryness, and cracking.
- **Potential Health Effects**
Eye: Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. May cause transient corneal injury. In the eyes of a rabbit, 0.1 ml of 70% isopropyl alcohol caused conjunctivitis, iritis, and corneal opacity.
Skin: May cause irritation with pain and stinging, especially if the skin is abraded. Isopropanol has a low potential to cause allergic skin reactions; however, rare cases of allergic contact dermatitis have been reported. May be absorbed through intact

skin. Dermal absorption has been considered toxicologically insignificant. The cases of deep coma associated with skin contact are thought to be a consequence of gross isopropanol vapor inhalation in rooms with inadequate ventilation, rather than being attributable to percutaneous absorption of isopropanol per se.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause kidney damage. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. The probable oral lethal dose in humans is 240 ml (2696 mg/kg), but ingestion of only 20 ml (224 mg/kg) has caused poisoning.

Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. May cause narcotic effects in high concentration. Causes upper respiratory tract irritation. Inhalation of vapors may cause drowsiness and dizziness.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis.

4 First aid measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Urine acetone test may be helpful in diagnosis. Hemodialysis should be considered in severe intoxication. Treat symptomatically and supportively.

5 Fire fighting measures

General Information: 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. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. May form explosive peroxides. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Extinguishing Media: Water may be ineffective. Do NOT use straight streams of water. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. For small fires, use carbon dioxide, dry chemical, dry sand, or alcohol-resistant foam. Cool containers with flooding quantities of water until well after fire is out.

6 Accidental release measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Use water spray to dilute spill to a non-flammable

mixture. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation. A vapor suppressing foam may be used to reduce vapors.

7 Handling and storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Keep container tightly closed. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Avoid breathing vapor or mist. Do not allow to evaporate to near dryness.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Do not store in direct sunlight. Store in a tightly closed container. Keep from contact with oxidizing materials. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. After opening, purge container with nitrogen before reclosing. Periodically test for peroxide formation on long-term storage. Addition of water or appropriate reducing materials will lessen peroxide formation. Store protected from moisture. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals. All peroxidizable substances should be stored away from heat and light and be protected from ignition sources.

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.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
MWCNTs 2-Propanol	(400 ppm) TWA; (500ppm) STEL	400 ppm TWA; 980 mg/m ³ TWA 2000 ppm IDLH (10 percent lower explosive limit)	400 ppm TWA; 980 mg/m ³ TWA

OSHA Vacated PELs: 2-Propanol: 400 ppm TWA; 980 mg/m³ TWA; 500 ppm STEL; 1225 mg/m³ STEL

Personal Protective Equipment

Eyes: Wear chemical goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR §1910.134

and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

9 Physical and chemical properties:

Physical State: Liquid dispersion

Appearance: Black liquid

Odor: alcohol-like

pH: Not available.

Vapor Pressure: 33 mm Hg @ 20 deg C

Vapor Density: 2.1 (Air=1)

Evaporation Rate:1.7 (n-butyl acetate=1)

Viscosity: 2.27 mPas @ 20C

Boiling Point: 82 deg C @ 760 mmHg

Freezing/Melting Point:-88 deg C

Autoignition Temperature: 399 deg C (750.20 deg F)

Flash Point: 12 deg C (53.60 deg F)

Decomposition Temperature:Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 3; Reactivity: 0

Explosion Limits, Lower:2.0 vol %

Upper: 12.7 @ 200°F

Solubility: Miscible.

Specific Gravity/Density: 1.17 (water=1)

Molecular Formula: MWCNTs, C₃H₈O

Molecular Weight:

10 Stability and reactivity

Chemical Stability: Under normal storage conditions, peroxidizable compounds can form and accumulate peroxides which may explode when subjected to heat or shock. This material is most hazardous when peroxide levels are concentrated by distillation or evaporation. Isopropanol is susceptible to autoxidation and therefore should be classified as peroxidizable.

Conditions to Avoid: Light, ignition sources, excess heat, exposure to moist air or water.

Incompatibilities with Other Materials: Attacks some forms of plastics, rubbers, and coatings., chlorine, carbonyl dichloride(phosgene), acetaldehyde, ethylene oxide, isocyanates, amines, aluminum at high temperatures, strong oxidizing agents, strong acids, ammonia, strong bases.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

11 Toxicological information

RTECS#:

CAS# 67-63-0: NT8050000

LD50/LC50:

CAS# 67-63-0:

Draize test, rabbit, eye: 100 mg Severe;

Draize test, rabbit, eye: 10 mg Moderate;

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 500 mg Mild;

Inhalation, rat: LC50 = 16000 ppm/8H;

Oral, mouse: LD50 = 3600 mg/kg;
Oral, rabbit: LD50 = 6410 mg/kg;
Oral, rat: LD50 = 5045 mg/kg;
Skin, rabbit: LD50 = 12800 mg/kg;<BR.

Carcinogenicity:

CAS# 67-63-0:

IARC: Group 3 carcinogen

Epidemiology: Experimental teratogenic and reproductive effects have been reported for isopropanol. Early epidemiological studies have suggested an association between the strong acid manufacture of isopropyl alcohol and paranasal sinus cancer in workers.

Teratogenicity: A rat & rabbit developmental toxicity study showed no teratogenic effects at doses that were clearly maternally toxic. In a separate rat study, no evidence of developmental neurotoxicity was associated with gestational exposures to IPA up to 1200 mg/kg/d.

Reproductive Effects: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Mutagenicity: See actual entry in RTECS for complete information.

Other Studies: Standard Draize Test: Administration onto the skin (rabbit) = 500 mg (Mild). Standard Draize Test: Administration into the eye (rabbit) = 100 mg (Moderate). Standard Draize Test : Administration into the eye = 10 mg (Moderate). Standard Draize test: Administration into the eye (rabbit) = 100 mg/24 H (Moderate).

12 Ecological information:

Ecotoxicity: Fish: Fathead Minnow: >1000 ppm; 96h; LC50 ia: >1000 ppm; 96h; LC50 Gold orfe: 8970-9280 ppm; 48h; LC50 IPA has a high biochemical oxygen demand and a potential to cause oxygen depletion in aqueous systems, a low potential to affect aquatic organisms, a low potential to affect secondary waste treatment microbial metabolism, a low potential to affect the germination of some plants, a high potential to biodegrade (low persistence) with unacclimated microorganisms from activated sludge.

Environmental: No information available.

Physical: THOD: 2.40 g oxygen/gCOD: 2.23 g oxygen/gBOD-5: 1.19-1.72 g oxygen/g

Other: No information available.

13 Disposal considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

14 Transport information

	US DOT	Canada TDG
Shipping Name:	MWCNTs in ISOPROPANOL,	MWCNTs in ISOPROPANOL, Dispersion

	Dispersion	
Hazard Class:	3	3
UN Number:	UN1219	UN1219
Packing Group:	II	II

15 Regulations

US FEDERAL

TSCA

CAS# 67-63-0 is listed on the TSCA inventory.

Health & Safety Reporting List

CAS# 67-63-0: Effective Date: December 15, 1986; Sunset Date: December 15, 1996

Chemical Test Rules

CAS# 67-63-0: Testing required by: manufacturers; importers; processors (40

Section 12b

CAS# 67-63-0: 4/12b

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

None of the chemicals in this material have an RQ.

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 67-63-0: acute, chronic, flammable.

Section 313

This material contains 2-Propanol (CAS# 67-63-0, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 67-63-0 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XI F

Risk Phrases:

R 11 Highly flammable.

R 36 Irritating to eyes.
R 67 Vapors may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 24/25 Avoid contact with skin and eyes.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 7 Keep container tightly closed.

WGK (Water Danger/Protection)

CAS# 67-63-0: 1

Canada

CAS# 67-63-0 is listed on Canada's DSL List. CAS# 67-63-0 is listed on Canada's DSL List.

This product has a WHMIS classification of B2, D2B.

CAS# 67-63-0 is listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 67-63-0: OEL-AUSTRALIA:TWA 400 ppm (980 mg/m³);STEL 500 ppm (1225 mg/m³) OEL-BELGIUM:TWA 400 ppm (985 mg/m³);STEL 500 ppm (1230 mg/m³) OEL-DENMARK:TWA 200 ppm (490 mg/m³);Skin OEL-FRANCE:STEL 400 ppm (980 mg/m³) OEL-GERMANY:TWA 400 ppm (980 mg/m³) OEL-JAPAN:STEL 400 ppm (980 mg/m³) OEL-THE NETHERLANDS:TWA 400 ppm (980 mg/m³);Skin OEL-THE PHILIPPINES:TWA 400 ppm (980 mg/m³) OEL-RUSSIA:STEL 400 ppm (1000 mg/m³) OEL-SWEDEN:TWA 150 ppm (350 mg/m³);STEL 250 ppm (600 mg/m³) OEL-SWITZERLAND:TWA 400 ppm (980 mg/m³);STEL 800 ppm OEL-TURKEY:TWA 200 ppm (500 mg/m³) OEL-UNITED KINGDOM:TWA 400 ppm (980 mg/m³);STEL 500 ppm;Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

16 Other information:

- Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.