

SAFTY DATA SHEET

Revised Date 09/21/2015

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**Product name: Zinc Oxide (ZnO) Ethanol (C₂H₆O) Dispersion

Product Number : US7017

Zinc Oxide (ZnO) CAS#: 1314-13-2

Ethanol (C₂H₆O) CAS#: 64-17-5**1.2 Relevant identified uses of the substance or mixture and uses advised against**

Identified uses : Research

1.3 Details of the supplier of the safety data sheetCompany: **US Research Nanomaterials, Inc.**

3302 Twig Leaf Lane

Houston, TX 77084

USA

Telephone: +1 832-460-3661

Fax: +1 281-492-8628

1.4 Emergency telephone number

Emergency Phone # : (832) 359-7887

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word

Warning

Hazard statement(s)

H225: Highly flammable liquid and vapor.

H336: May cause drowsiness or dizziness.

H371: May cause damage to organs through prolonged or repeated exposure.

Precautionary statement(s)

P233: Keep container tightly closed.

P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P240: Ground/Bond container and receiving equipment.
P241: Use explosion-proof-electrical/ventilating/lighting/.../equipment
P242: Use only non-sparking tools.
P243: Take precautionary measures against static discharge.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P303+P361+P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P312 Call a POISON CENTER or doctor/ physician if you feel unwell.
P370+P378: In case of fire: Use ... for extinction.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

None

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Zinc Oxide (ZnO) CAS#: 1314-13-2

Ethanol (C₂H₆O) CAS#: 64-17-5

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use water spray to cool unopened containers. Cool closed containers exposed to fire with water spray.

5.2 Special hazards arising from the substance or mixture

Carbon monoxide (CO) Carbon dioxide (CO₂)

5.3 Advice for firefighters

Wear self contained breathing apparatus for firefighting if necessary.

5.4 Further information

no data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Personal, workplace or environmental monitoring may be necessary to ensure exposures are below recommended and legal limits.

ACGIH: STEL: 1000 ppm

NIOSH: 1000 ppm TWA; 1900 mg/m³ TWA; 3300 ppm IDLH

OSHA (US): 1000 ppm TWA; 1900 mg/m³ TWA

Mexico: 1000 ppm TWA LMPE-PPT; 1900 mg/m³ TWA

EU: 1000 ppm; 1880 mg/m³

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

For any handling steps where the substance is in particulate form or in a suspension with pure water where the substance is not solubilized, the gloves must be comprised of material that successfully passes ASTM F-1671. For any handling steps where the substance is part of a carrier liquid, other than the aqueous suspension noted in the previous paragraph, gloves must be comprised of material that successfully passes ASTM F-739 (continuous liquid contact method). Gloves must be changed before they show degradation and before the designated breakthrough time for the carrier liquid (as determined by the ASTM F-739 testing or by the manufacturer). Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

The EPA mandates the use of full face respirators with minimum N100 grade cartridges if there is any risk of exposure to carbon nanotube dust. For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

- a) Appearance: liquid
- b) Odour: sweet, Characteristic
- c) Odour Threshold: No information available
- d) pH: no data available
- e) Melting point/freezing point: -114 - -173.2 °C
- f) Initial boiling point and boiling range: 78 – 172.4 °C
- g) Flash point: 12 °C
- h) Evaporation rate: no data available
- i) OSHA Flammability Class: no data available
- j) Upper/lower flammability or explosive limits: 19 vol%/3.3 vol%
- k) Vapour pressure: no data available
- l) Vapour density (air = 1): no data available
- m) Relative density (water = 1): 0.789
- n) Water solubility: no data available
- o) Partition coefficient - octanol/water: no data available
- p) Auto-ignition temperature: 363 °C
- q) Decomposition temperature: no data available
- r) Viscosity: no data available
- s) Explosive properties: no data available
- t) Molecular Weight: 46.068

9.2 Other safety information

no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

Will not polymerize. Vapors may form explosive mixture with air.

10.2 Chemical stability

Stable at normal temperature and pressures.

10.3 Possibility of hazardous reactions

Will not polymerize. May decompose, exotherm or catch fire with mixed with incompatible materials.

10.4 Conditions to avoid

Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers. Do not store at elevated temperatures.

10.5 Incompatible materials

Strong acids, strong bases, strong oxidizers, nitrates

10.6 Hazardous decomposition products

Other decomposition products - Carbon monoxide (CO), Carbon dioxide (CO₂)

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity LD50 rat: 3450 mg/kg (RTECS)

Acute inhalation toxicity: 20000 ppm/10H(rat)

Acute dermal toxicity LD50 rabbit: Not listed

Skin corrosion/irritation

Moderate, 500mg/m³, skin, rabbits (IUCLID)

Serious eye damage/eye irritation

300 ppm, human (IUCLID)

Respiratory or skin sensitisation

Negative, guinea pig (IUCLID)

Germ cell mutagenicity

no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

no data available

Specific target organ toxicity - single exposure

Central nervous system, drowsiness, dizziness

Specific target organ toxicity - repeated exposure

Not classified as specific target organ toxicity.

Aspiration hazard

Product may be an aspiration hazard

Additional Information

Headache, nausea in high concentrations. Handle using good occupational and environmental health practices.

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity in fish LC50: 14200 mg/L/96h (IUCLID: 96 hour, fathead minnow)

Toxicity to daphnia and other aquatic invertebrates: 72 mg/L; (IUCLID: 72 hour, Daphnia magna)

Toxicity to algae: 275 mg/L (IUCLID: 72 hr. Desmodesmus subspicatus)

12.2 Persistence and degradability

Biodegradable 100%

12.3 Bioaccumulative potential

Not expected

12.4 Mobility in soil

no data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

Do not allow product to enter surface waters, wastewater or soil.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

14. TRANSPORT INFORMATION

US DOT Information

Shipping Name: Ethanol

Hazard Class: 3

UN/NA #: UN1170

Packing Group: II

Required Label(s): 3

IMDG Information

Shipping Name: Ethanol

Hazard Class: 3

UN #: UN1170

Packing Group: II

IATA Information

Shipping Name: Ethanol

Hazard Class: 3

UN #: UN1170

Packing Group: II
Required Label(s): 3

15. REGULATORY INFORMATION

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the

threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

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New Jersey Right To Know Components

Zinc Oxide (ZnO) CAS#: 1314-13-2

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California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H226 Highly flammable liquid and vapour.

H336 May cause drowsiness or dizziness.

STOT SE Specific target organ toxicity - single exposure

HMIS Rating

Health hazard: 2

Chronic Health Hazard:

Flammability: 3

Physical Hazard 0

NFPA Rating

Health hazard: 2

Fire Hazard: 3

Reactivity Hazard: 0

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product.

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 Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.