



GENERAL ENGINEERING AND RESEARCH

Safety Data Sheet

Amine Functionalized Silica Nanoparticles in Ethanol

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Amine Functionalized Silica Nanoparticles in Ethanol,
20nm – 200nm Amine Functionalized Silica Nanoparticles
in Ethanol

COMMON SYNONYMS: Amine functionalized Silicon Dioxide nanoparticles
dispersed in ethanol, amine terminated silica, colloidal
silica, amorphous silica

CHEMICAL FAMILY: Silicon Compounds
FORMULA: $\text{SiO}_2 \text{ NH}_2$ dispersed in Ethanol

Identified uses: Laboratory chemical, Manufacture of substances

Supplier: General Engineering & Research, L.L.C.
10459 Roselle St. Ste. A
San Diego, CA 92121-1527

Information: 858-291-8336

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

OSHA Hazards: Inhalation of mist or dust may be harmful. Avoid repeated or prolonged breathing of spray mist or dust.

2.1 Classification of the substance or mixture

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

Specific target organ toxicity – repeated exposure (Category 1), H372

Flammable liquids (Category 2), H225.

Eye irritation (Category 2A), H319

For the full text of the H-Statement mentioned in the Section, see Section 16.

2.2 GHS Label elements, including precautionary statements



Pictogram
Signal word

Danger

Hazard statement(s)

H372 Causes damage to organs through prolonged or repeated exposure.

H225 Highly flammable liquid and vapour.



H319 Causes serious eye irritation.

Precautionary statement(s)

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Keep container tightly closed.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Wear protective gloves/ eye protection/ face protection.
IF ON SKIN (or hair): Take off immediately all contaminated clothing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/ attention.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Do not eat, drink or smoke when using this product.
Get medical advice/ attention if you feel unwell.
Store in a well ventilated place. Keep cool.
Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Component</u>	<u>Cas-No.</u>	<u>Concentration</u>
Ethanol	64-17-5	>95.0%
Colloidal Silica	7631-86-9	<5.0%

Appearance

Form Liquid
Colour clear to white
Odour none

3.1 Substances

Formula: O₂Si
Molecular weight: 60.08 g/mol
Cas-No.: 7631-86-9

Formula: C₂H₆OH
Molecular weight: 46.07 g/mol
Cas-No: 64-17-5

<u>Hazardous Component</u>	<u>Classification</u>	<u>Concentration</u>
Silicon dioxide (amorphous)	STOT RE 1: H372	1%
Ethanol	Flam. Liq. 2; Eye Irrat. 2A; H225, H319	99%



For the full text of H-Statements mentioned in this Section, see Section 16.

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

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

If swallowed

Do NOT induce vomiting. 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 Section 2.

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

silicon oxides, carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.



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. Avoid breathing dust. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. 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

Handling

Use only well ventilated areas. Avoid contact with eyes. Avoid contact with skin, inhalation and ingestion. Avoid breathing vapor. Avoid breathing dust. Use explosion-proof equipment. Keep away from sources of ignition – No smoking. Take measures to prevent the buildup of electrostatic discharge. Keep from freezing. Keep away from children.

Storage

Storage conditions: Keep container tightly closed in a dry and well-ventilated place. Storage class (TRGS 510): Flammable liquids

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits(s)

Exposure limits are listed below, if they exist.

Component	CAS-No.	Value	Control parameters	Basis
Silicon dioxide	7631-86-9	TWA	6.0 mg/m ³	USA. NIOSH Recommended Exposure Limits
		TWA	20.0 Million particles per cubic foot	USA. Occupational Exposure Limits (OSHA) – Table Z-3 Mineral Dusts
		TWA	80.0 mg/m ³ / % SiO ₂	USA. Occupational Exposure Limits (OSHA) – Table Z-3 Mineral Dusts
		Millions of particles per cubic foot of air, based on impinge samples counted by light-field techniques. mppcf X 35.3 = million particles per cubic meter = particles per c.c.		



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Silicon dioxide	7631-86-9	TWA	1,000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation Confirmed animal carcinogen with unknown relevance to humans		
		TWA	1,000ppm 1,900 mg/m3	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	1,000ppm 1,900 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate		
		TWA	1,000.00000 Ppm 1,900.00000 Mg/m3	USA. NIOSH Recommended Exposure Limits
		STEL	1,000.00000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Confirmed animal carcinogen with unknown relevance to humans		

Eye protection: Goggles

Hand protection: Nitrile rubber gloves. Other chemical resistant gloves may be recommended by your safety professional.

Skin and body protection: Normal work wear.

Respiratory protection: No personal respiratory protective equipment normally required. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

Engineering measures: Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (local exhaust), and control of process conditions.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	liquid
Colour	clear to white
Odour	none
pH	9.0 – 11.0
Boiling point/range	78.0-80.0 C
Flash point	13 C – closed cup

Component: **Silica**

Relative vapour density	Heavier than air.
Water solubility	partly soluble
Relative density	1.00 – 1.20
Evaporation rate	Slower than ether



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VOC's 0 g/l

Note: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Hazardous reactions Stable under normal conditions
Conditions to avoid Heat, flames and sparks, freezing temperatures
Materials to avoid strong oxidizers, alkali metals, peroxides
Hazardous decomposition Products oxides of silicon, irritating fumes, acidic fumes
Polymerization Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Component: **Silica**

Acute oral toxicity LD50 rat > 3,000 mg/kg

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Carcinogenicity

Carcinogenicity - Rat – Inhalation

Tumorigenic: Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration: Tumors.

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: 3 - Group 3: Not classifiable as to its carcinogenicity to humans (Silicon dioxide)

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.



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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

No data available

Specific target organ toxicity - repeated exposure

No data available

The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Aspiration hazard

No data available

Additional Information

RTECS: Not available

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

Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

13. DISPOSAL CONSIDERATIONS

Environmental precautions: Prevent the material from entering drains or water courses. Advise Authorities if spillage has entered watercourse or sewer or has contaminated soil or vegetation.

Disposal

Dispose in accordance with all local, state (provincial), and federal regulations. Under RCRA, it is the responsibility of the product's user to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because the product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Do not remove label until container is thoroughly cleaned. Empty containers may contain hazardous residues. This material and its container must be disposed of in a safe way.



14. TRANSPORT INFORMATION

DOT (US): UN number: 1170 Class: 3 Packing group: II
 Proper shipping name: Ethanol
 Reportable Quantity (RQ):
 Marine pollutant: No
 Poison Inhalation Hazard: No
IMDG: UN number: 1170 Class: 3 Packing group: II EMS-No: F-E, S-D
 Proper shipping name: ETHANOL
 Reportable Quantity (RQ):
 Marine pollutant: No
IATA: UN number: 1170 Class: 3 Packing group: II
 Proper shipping name: Ethanol
 SHIPPING NAME (CFR): Non-hazardous.
 SHIPPING NAME (IATA): Non-hazardous.

Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations.

15. REGULATORY INFORMATION

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

SARA TITLE III: Section 311/312 Categorizations (40CFR370): Immediate health hazard, Fire Hazard, Acute Health Hazard, Chronic Health Hazard

SARA TITLE III: Section 313 Information (40CFR372)
 This product does not contain a chemical which is listed in Section 313 at or above de minimis concentrations.

US. Toxic Substances Control Act (TSCA) All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

California (Proposition 65)
 This product does not contain materials which the State of California has found to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.
 H372 Causes damage to organs through prolonged or repeated exposure.
 STOT RE Specific target organ toxicity – repeated exposure

Hazard Rating

	Health	Chronic	Fire	Reactivity



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		Health Hazard		
HMIS Rating	2	*	3	0
NFPA Rating	2		3	0

Legend

ACGIH	American Conference of Governmental Industrial Hygienists
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weighted Average

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.