



Material Safety Data Sheet

Prepared on: May 27, 2014

MagReSyn[®] ZrO₂

1. PRODUCT AND COMPANY IDENTIFICATION

Product code MR-ZRD002 (2 ml); MR-ZRD005 (5 ml); MR-ZRD010 (2 x 5 ml)
Product name MagReSyn[®] ZrO₂
General Use Magnetic microparticles with immobilized zirconium dioxide nanoparticles suspended in a 20% ethanol solution. The product is intended for biomolecule (specifically phosphopeptide) immobilization for a variety of subsequent end-user applications in research and development. This product is for research and development use only. It is not intended for any animal or human therapeutic or diagnostic use unless otherwise stated.

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2. COMPOSITION

Hazardous/Non-hazardous Components

Chemical Name	CAS #	Weight %
MagReSyn [®] ZrO ₂	-----	5.0%
Ethanol	64-17-5	20%
Water	7732-18-5	75%

Synonyms for Ethanol: Ethyl alcohol, alcohol

3. HAZARDS IDENTIFICATION

GHS Classification for Ethanol: FLAMMABLE LIQUIDS, Category 2: Highly flammable liquid and vapor

SERIOUS EYE DAMAGE/IRRITATION, Category 2B:
Warning

SPECIFIC TARGET ORGAN SYSTEMIC TOXICITY
(SINGLE EXPOSURE), Category 3: Warning
Reproductive toxicity, Category 1: Danger

Signal Words for Ethanol: DANGER

GHS Hazard Statements: PHYSICAL HAZARDS:
Highly flammable liquid and vapor.

HEALTH HAZARDS:
Causes eye irritation.
Reproductive toxicant.
May be harmful if swallowed and enters airways.

ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS
criteria.

**GHS Precautionary Statements
for Ethanol:**

PREVENTION:
Keep away from heat/sparks/open flames/hot surfaces.
No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting
equipment. Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray.
Wash hands thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye
protection/face protection.

RESPONSE:
IF SWALLOWED: Immediately call a POISON CENTER or
doctor/physician. Induce vomiting only if directed to by
medical personnel.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

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 chemical, foam or other appropriate extinguishing media.

STORAGE:

Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up.

DISPOSAL:

Dispose of contents and container to appropriate waste site or reclaimed in accordance with local and national regulations.

**GHS Label Elements Symbol(s)
for Ethanol:**



Form Solid in an ethanol aqueous formulation

HMIS (for ethanol)

Health	2
Flammability	3
Reactivity	0

4. FIRST AID MEASURES

Skin contact	Wash or flush skin immediately and thoroughly with soap and water, If irritation develops, seek medical attention
Eye contact	Flush for 15 minutes thoroughly with plenty of water; seek medical attention
Ingestion	If ingested contact a physician; do not give anything by mouth to an unconscious person. Transport to nearest medical facility for additional treatment. Do not induce vomiting.
Inhalation	Move to fresh air. If breathing becomes difficult, seek medical aid.
Notes to physician	Treat symptomatically

5. FIRE-FIGHTING MEASURES

In the event of fire, responders should follow appropriate protective measures to prevent skin contact and inhalation.

Suitable extinguishing media

Dry chemical, foam or other appropriate extinguishing media. Water may be ineffective.

Special protective equipment for firefighters

Wear self-contained breathing apparatus and protective equipment as appropriate for fire response activities.

Special Considerations:

Highly flammable. Material can burn with an invisible flame.

6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local and international regulations. Avoid contact with spilled or released material.

Personal precautions

In the event of a spill or leak, use personal protective equipment to minimize contact with skin.

Keep away from heat, sparks and open flame.

Provide sufficient ventilation

Methods for cleaning up

Clean up spill immediately using an inert absorbent material; dispose of according to applicable local, regional, or federal regulations.

7. HANDLING AND STORAGE

Handling

Avoid dust formation; avoid contact with skin and eyes. Avoid breathing vapor; avoid contact with eyes, skin and clothing. Keep away from ignition sources, use only electrically grounded handling equipment and ensure adequate ventilation/fume exhaust hoods. Do not eat, drink or smoke while handling.

Storage

Keep in properly labeled containers. Store in ventilated room or shade below 27°C (80°F) and away from direct sunlight. Follow all precautionary information on container label. Keep away from oxidizing agents, reducing agents, acids, alkalis, and moisture.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits

Chemical Name	OSHA PEL (TWA)	OSHA PEL (ceiling)	ACGIH TLV	MAK
Titanium Dioxide	15 mg/m ³	None	10 mg/m ³	None
Ethanol	1000 ppm	None	1000 ppm	500 ppm

Engineering measures

Ensure adequate fresh air ventilation is available, especially in confined areas; use local exhaust ventilation

Personal protective equipment

Respiratory protection

In case of insufficient ventilation, wear particulate respiratory protection

Hand protection

Use protective gloves to prevent unnecessary skin contact

Eye protection

Use safety glasses with side-shields or safety goggles

Skin and body protection

Lightweight protective clothing

Hygiene measures

Handle in accordance with good laboratory hygiene practices

Environmental exposure controls

Prevent product from entering drains

9. PHYSICAL AND CHEMICAL PROPERTIES

	MagReSyn[®] ZrO₂ Microparticles	Water	Ethanol
Physical form	Solid in aqueous media	Clear liquid	Clear liquid
Color	Black	Colorless	Colorless
Odor	None	None	Mild
Boiling Point	No data available	100°C / 212°F	78°C / 172 °F
Melting Point	No data available	0°C / 32°F	-114°C / -173 °F
Flash Point	No data available	Non-flammable	13°C / 55°F 36°C / 97°F (20%)
Auto ignition temperature	No data available	Not applicable	363°C/ 685 °F
Oxidizing properties	No data available	No data available	No data available
Water Solubility	No data available	Complete	at 20 °C / 68 °F Completely miscible
pH	Not applicable (for solid spheres)	7.0	Not applicable
Specific Gravity	No data available	1.00 at 20 °C / 68 °F	.790 at 20 °C / 68 °F
Viscosity	Not applicable	No data available	1.200 cP at 20 °C / 68 °F
Flammability	No data available	Not applicable	Flammable
Vapor Density (air =1)	Not applicable	Not applicable	1.59 at 20 °C / 68 °F
Vapor pressure	Not applicable	No data available	44 mmHG at 20°C / 68 °F
Lower/upper explosive limit	No data available	Not applicable	3.3% to 19%
Decomposition temperature	No data available	Stable under normal conditions of use	Stable under normal conditions of use

10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions of use
Materials to avoid	None known
Hazardous decomposition products	None expected under normal use conditions.
Polymerization	Hazardous polymerization is not known to occur

11. TOXICOLOGICAL INFORMATION

Chemical Name	LD50 (oral)	LD50 (dermal)	LC50 (inhalation)
MagReSyn [®] ZrO ₂ Microparticles	No data available	No data available	No data available
Water	Low toxicity	Low toxicity	Low toxicity
Ethanol	Low/moderate toxicity. LD50: 3450-7060 mg/kg (rat)	Low toxicity	Expected to be of low toxicity if inhaled. LC50: 20,000-20,363 mg/kg (rat)

Complete toxicological properties have yet to be determined for nanoparticles.

Principle Routes of Exposure/ Potential Health effects

Eyes	May cause eye irritation in the event of contact
Skin	May cause skin irritation and/or dermatitis on contact; not a skin sensitizer
Inhalation	May cause irritation of respiratory tract if vapor is inhaled. Inhalation of high concentrations may cause effects to the central nervous system.
Ingestion	Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhea. Causes central nervous system impairment occurs at high doses.

Specific Effects

Carcinogenic effects	No known significant effects or critical hazards.
Mutagenic effects	No known significant effects or critical hazards.
Reproductive toxicity	Ethanol has been shown to cause fetotoxicity.
Sensitization	No known significant effects or critical hazards.
Target Organ Effects	Eyes, Liver, Kidneys, Central Nervous System.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects	No known significant effects or critical hazards.
Mobility	No known significant effects or critical hazards. If acetone enters soil, it will be mobile and may contaminate groundwater. Dissolves in water.
Biodegradation	No known significant effects or critical hazards.
Bioaccumulation	No known significant effects or critical hazards.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local, regional, or federal regulations. Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification. Do not dispose into the environment, in drains or in water courses. Waste product should not be allowed to contaminate soil or water.

14. TRANSPORT INFORMATION

Proper shipping name	None
US DOT	Non-hazardous for transport
IATA	Non-hazardous for air transport

15. REGULATORY INFORMATION

International Inventories

Chemical Name	TSCA	PICCS	ENCS	DSL	NDSL	AICS
Titanium Dioxide	Yes	Yes	Yes	Yes	No	Yes
Water	Yes	Yes	Yes	Yes	No	Yes
Ethanol	Yes	Yes	Yes	Yes	No	Yes

International Agency for Research on Cancer

None of the ingredients has been listed

National Toxicology Program

None of the ingredients has been listed

U.S. Federal Regulations

SARA 313

This product is not regulated under SARA

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)

This product does not contain HAPs

California Proposition 65

This products contains ethanol, a chemical known to have reproductive and developmental toxicological effects

16. OTHER INFORMATION

For ethanol: R-phrase(s)

R11 Highly flammable.

For ethanol: S-phrase(s)

S-2 Keep out of the reach of children.

S-7 Keep container tightly closed.

S-9 Keep container in a well-ventilated place.

S-16 Keep away from sources of ignition - No Smoking.

For titanium dioxide: R-phrase(s)

R49 Suspected carcinogen by inhalation route of exposure.

This material is sold for research and development purposes only. It is not intended for food, drug, household, agricultural, or cosmetic use. An individual technically qualified to handle potentially hazardous chemicals must supervise the use of this material.

This information is based on our present knowledge and is subject to revision.