

## SAFETY DATA SHEET

### 1. SUBSTANCE AND SOURCE IDENTIFICATION

**Product Identifier**

**SRM Number:** 1992  
**SRM Name:** Zeta Potential - Colloidal Silica (Nominal Mass Fraction 0.15 %)  
**Other Means of Identification:** Not applicable.

**Recommended Use of This Material and Restrictions of Use**

This Standard Reference Material (SRM) is intended for use in instrument performance certification for electrophoretic mobility and zeta potential by optical methods. SRM 1992 consists of nominally 5 mL of colloidal silica particles (0.15 %) in an aqueous 0.1 % borate buffer at pH 8.9, sterilized by filtration. The SRM is supplied in hermetically sealed pre-scored amber glass ampoules. A unit of SRM 1992 consists of four 5 mL ampoules.

**Company Information**

National Institute of Standards and Technology  
 Standard Reference Materials Program  
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### 2. HAZARDS IDENTIFICATION

**Note:** This material should be handled as recommended by the National Institute for Occupational Safety and Health (NIOSH). According to NIOSH, occupational health risks associated with manufacturing and using nanomaterials are not fully understood. Minimal information is currently available on dominant exposure routes, potential exposure levels, and material toxicity of nanomaterials.

**Classification**

**Physical Hazard:** Not classified.  
**Health Hazard:** Not classified.

**Label Elements**

**Symbol:**  
 No Symbol.

**Signal Word:**  
 No Signal Word.

**Hazard Statement(s):** Not applicable.

**Precautionary Statement(s):** Not applicable.

**Hazards Not Otherwise Classified:** Not applicable.

**Ingredients(s) with Unknown Acute Toxicity:** Not applicable.

### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

**Substance:** Colloidal silica particles (0.15 %) in an aqueous 0.1 % borate buffer suspension.

**Other Designations:**

Silicon dioxide amorphous, amorphous silica spheres, amorphous colloidal silica aqueous solution

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate.

Non-Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Silicon dioxide amorphous colloidal	7631-86-9	231-545-4	0.15
Sodium tetraborate	1330-43-4	215-540-4	0.077
Boric acid	10043-35-3	233-139-2	0.025
Water	7732-18-5	231-791-2	>99

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#### 4. FIRST AID MEASURES

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##### Description of First Aid Measures:

**Inhalation:** If adverse effects occur, remove to uncontaminated area. Get medical attention.

**Skin Contact:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention.

**Eye Contact:** Immediately flush eyes, including under the eyelids with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

**Ingestion:** If a large amount is swallowed, get medical attention.

**Most Important Symptoms/Effects, Acute and Delayed:** No information on significant adverse effects.

**Indication of any immediate medical attention and special treatment needed, if necessary:** If adverse effects are present, seek immediate medical attention.

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#### 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Negligible fire hazard.

##### Extinguishing Media:

Suitable: Use extinguishing media appropriate to the surrounding fire.

Unsuitable: Full-force water jet.

**Specific Hazards Arising from the Chemical:** Thermal decomposition will form oxides of carbon (carbon monoxide, carbon dioxide). Heating causes rise in pressure with risk of bursting.

**Special Protective Equipment and Precautions for Fire-Fighters:** Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

**NFPA Ratings** (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1

Fire = 0

Reactivity = 0

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#### 6. ACCIDENTAL RELEASE MEASURES

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**Personal Precautions, Protective Equipment and Emergency Procedures:** Immediately contact emergency personnel. Keep unnecessary personnel away. Keep away from heat and other ignition sources. Use explosion-proof equipment and non-sparking tools. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

**Methods and Materials for Containment and Clean up:** Do not touch spilled material. Notify safety personnel of spills. Stop leak if safe to do so. Dam up the liquid spill. Absorb with non-combustible material. Collect spilled material in appropriate container for disposal. Avoid release to the environment

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#### 7. HANDLING AND STORAGE

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**Safe Handling Precautions:** See Section 8, "Exposure Controls and Personal Protection".

**Storage:** Store and handling in accordance with all current regulations and standards. Please see Certificate for additional information.

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#### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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**Exposure Limits:** No occupational limits established.

**Engineering Controls:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Personal Protection:** In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

**Respiratory Protection:** If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29 CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye/Face Protection:** Wear splash resistant safety goggles. An eye wash station should be readily available near areas of use.

**Skin and Body Protection:** Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals. Wear long-sleeved clothing.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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### Descriptive Properties:

<b>Appearance (physical state, color, etc.):</b>	Liquid, hazy appearance
<b>Molecular Formula:</b>	Not applicable
<b>.Molar Mass (g/mol):</b>	Not applicable
<b>Odor:</b>	Not available
<b>Odor threshold:</b>	Not available
<b>pH:</b>	8.9
<b>Evaporation rate:</b>	Not available
<b>Melting point/freezing point (°C):</b>	Not available
<b>Relative Density (g/L):</b>	Not available
<b>Vapor Pressure (mmHg):</b>	Not available
<b>Vapor Density (air = 1):</b>	Not available
<b>Viscosity (cP):</b>	Not available
<b>Solubility(ies):</b>	Not available
<b>Partition coefficient (n-octanol/water):</b>	Not available
<b>Particle Size:</b>	140 nm

### Thermal Stability Properties:

<b>Autoignition Temperature (°C):</b>	Not applicable
<b>Thermal Decomposition (°C):</b>	Not available
<b>Initial boiling point and boiling range (°C):</b>	Not available
<b>Explosive Limits, LEL (Volume %):</b>	Not applicable
<b>Explosive Limits, UEL (Volume %):</b>	Not applicable
<b>Flash Point (°C)</b>	Not applicable
<b>Flammability (solid, gas):</b>	Not applicable

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** Stable at ambient temperature under normal conditions of use.

**Stability:**  X  Stable   Unstable

**Possible Hazardous Reactions:** Toxic fumes are produced when heated.

**Conditions to Avoid:** Avoid freezing. To avoid thermal decomposition, do not overheat.

**Incompatible Materials:** Not available.

**Fire/Explosion Information:** See Section 5, "Fire Fighting Measures".

**Hazardous Decomposition:** Carbon dioxide and carbon monoxide formed under fire conditions; see Section 5.

**Hazardous Polymerization:**   Will Occur  X  Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Exposure:** \_\_\_\_\_ Inhalation      X   Skin      X   Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** No data available.

**Potential Health Effects (Acute, Chronic, and Delayed):**

**Inhalation:** No data available.

**Skin Contact:** May cause irritation.

**Eye Contact:** May cause irritation.

**Ingestion:** May be harmful by ingestion in large amounts.

**Numerical Measures of Toxicity:**

**Acute Toxicity:** Not classified.

**Skin Corrosion/Irritation:** Not classified.

**Serious Eye damage/ Eye irritation:** Not classified.

**Respiratory Sensitization:** Not classified.

**Skin Sensitization:** Not classified.

**Germ Cell Mutagenicity:** Not classified.

**Carcinogenicity:** Not classified.

**Listed as a Carcinogen/Potential Carcinogen**    \_\_\_\_\_ Yes      X   No  
Components are not listed in NTP, IARC or OSHA as a carcinogen.

**Reproductive Toxicity:** Not classified.

**Specific Target Organ Toxicity, Single Exposure:** Not classified.

**Specific Target Organ Toxicity, Repeated Exposure:** Not classified.

**Aspiration Hazard:** Not classified.

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**12. ECOLOGICAL INFORMATION**

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**Ecotoxicity Data:** No data available.

**Persistence and Degradability:** No data available.

**Bioaccumulative Potential:** No data available.

**Mobility in Soil:** No data available.

**Other Adverse effects:** No data available.

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**13. DISPOSAL CONSIDERATIONS**

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**Waste Disposal:** Dispose of waste in accordance with all applicable federal, state, and local regulations.

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**14. TRANSPORTATION INFORMATION**

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**U.S. DOT and IATA:** This material is not regulated by DOT or IATA.

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**15. REGULATORY INFORMATION**

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**U.S. Regulations:**

CERCLA Sections 102a/103 (40 CFR 302.4): Not applicable to the identified NIST SRM.

SARA Title III Section 302 (40 CFR 355.30): Not applicable to the identified NIST SRM.

SARA Title III Section 304 (40 CFR 355.40): Not applicable to the identified NIST SRM.

SARA Title III Section 313 (40 CFR 372.65): Not applicable to the identified NIST SRM.

OSHA Process Safety (29 CFR 1910.119): Not applicable to the identified NIST SRM.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH: No.  
CHRONIC HEALTH: No.  
FIRE: No.  
REACTIVE: No.  
PRESSURE: No.

**State Regulations:**

California Proposition 65: Not listed.

**U.S. TSCA Inventory:** Silica listed.

**TSCA 12(b), Export Notification:** Not listed.

**Canadian Regulations:**

WHMIS Information: Not provided for this material.

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**16. OTHER INFORMATION**

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**Issue Date:** 15 December 2020

**Sources:** Vendor SDS, European Commission, Joint Research Centre, SDS *ERM-FD305*, 08 June 2019.

ChemAdvisor, Inc., SDS *Water*, 09 December 2015.

ChemAdvisor, Inc., SDS *Sodium Borate Decahydrate*, 09 December 2015.

ChemAdvisor, Inc., SDS *Boric Acid*, 09 December 2015.

ChemAdvisor, Inc., SDS *Silicon Dioxide*, 09 December 2015.

NIOSH Publications, *Approaches to Safe Nanotechnology: Managing the Health and Safety Concerns Associated with Engineered Nanomaterials*; available at <https://www.cdc.gov/niosh/docs/2009-125/pdfs/2009-125.pdf?id=10.26616/NIOSH PUB2009125> (accessed Dec 2020).

NIOSH Publications, *General Safe Practices for Working with Engineered Nanomaterials in Research Laboratories*, available at <https://www.cdc.gov/niosh/docs/2012-147/> (accessed Dec 2020).

## Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50%	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System
n.o.s.	Not Otherwise Specified		

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Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; e-mail [srmmsds@nist.gov](mailto:srmmsds@nist.gov); or via the Internet at <https://www.nist.gov/srm>.