Date of Issue:

27 May 2014

**SAFETY DATA SHEET**

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| **1. Substance and Source Identification** |

**Product Identifier**

**SRM Number:** 338

**SRM Name:** White cast iron (Carbon & Sulfur)

**Other Means of Identification:** Not applicable.

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

This Standard Reference Material (SRM) is in the form of a fine, water-atomized powder with a particle size between 0.045 mm (325 mesh sieve) and 0.10 mm (145 mesh sieve) and is intended for use in calibrating instruments used in the determination of carbon and sulfur. A unit of SRM 338 consists of a bottle containing 150 g of material.

**Company Information**

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| National Institute of Standards and Technology |  |
| Standard Reference Materials Program |  |
| 100 Bureau Drive, Stop 2300 |  |
| Gaithersburg, Maryland 20899-2300 |  |
|  |  |
| Telephone: 301-975-2200 | Emergency Telephone ChemTrec: |
| FAX: 301-948-3730 | 1-800-424-9300 (North America) |
| E-mail: [SRMMSDS@nist.gov](mailto:SRMMSDS@nist.gov) | +1-703-527-3887 (International) |
| Website: <http://www.nist.gov/srm> |  |

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| **2. HAZARDS IDENTIFICATION** |

**Classification**

**Physical Hazard:** Not classified.

**Health Hazard:** Not classified.

**Label Elements**

**Symbol**

No Symbol/Pictogram

**Signal Word**

Not applicable.

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

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

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

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

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| **3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS** |

**Substance:** White cast iron

**Other Designations:** White cast iron (iron, ferrium, iron powder).

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

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| **Hazardous Component(s)** | **CAS Number** | **EC Number**  **(EINECS)** | **Nominal Mass Concentration  (%)** |
| Iron powder | 7439-89-6 | 231-096-4 | 100 |

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| **4. FIRST AID MEASURES** |

**Description of First Aid Measures:**

**Inhalation:** If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

**Skin Contact:** Wash skin with soap and water.

**Eye Contact:** Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

**Ingestion:** If adverse effects occur after ingestion, seek medical treatment.

**Most Important Symptoms/Effects, Acute and Delayed:** May cause irritation.

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

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| **5. FIRE FIGHTING MEASURES** |

**Fire and Explosion Hazards:** Negligible fire hazard. Dust air mixtures may ignite or explode. Avoid generating dust. See Section 9, “Physical and Chemical Properties” for flammability properties.

**Extinguishing Media:**

Suitable: Dolomite, dry powder for metal fires, dry sand, graphite, soda ash, sodium chloride.

Unsuitable: None listed.

**Specific Hazards Arising from the Chemical:** None listed.

**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** |

**Personal Precautions, Protective Equipment and Emergency Procedures:** Any accumulated material on surfaces should be removed and properly disposed of. Use suitable protective equipment; see Section 8, “Exposure Controls and Personal Protection”.

**Methods and Materials for Containment and Clean up:** Collect spilled material in appropriate container for disposal. Clean up residue with a high‑efficiency particulate filter vacuum. Keep unnecessary people away, isolate hazard area and deny entry.

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| **7. HANDLING AND STORAGE** |

**Safe Handling Precautions:** Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. See Section 8, “Exposure Controls and Personal Protection”.

**Storage:** Store and handling in accordance with all current regulations and standards. Store in original container in a cool dry place.

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| **8. EXPOSURE CONTROLS AND PERSONAL PROTECTION** |

**Exposure Limits:** No occupational exposure limits have been established for marine sediment. This material is a particulate matter and adequate inhalation/respiratory protection should be used to minimize exposure. The exposure limits for Particulates Not Otherwise Regulated (PNOR) are applicable.

OSHA (PEL): 15 mg/m3 (TWA, total particulates not otherwise regulated)

OSHA (PEL) 5 mg/m3 (TWA, respirable particulates not otherwise regulated)

NIOSH (REL): 10 mg/m3 (TWA, total particulates not otherwise regulated, 8 h)

NIOSH (REL): 5 mg/m3 (TWA, respirable particulates not otherwise regulated)

**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 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye/Face Protection:** Wear splash resistant safety goggles with a face shield. 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.

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| **9**. **Physical and Chemical Properties** |

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| **Descriptive Properties:** |  |
| **Appearance  (physical state, color, etc.):** | white to gray powder |
| **Molecular Formula:** | Fe |
| **Molar Mass (g/mol):** | 55.85 |
| **Odor:** | not available |
| **Odor threshold:** | not available |
| **pH:** | not available |
| **Evaporation rate:** | not applicable |
| **Melting point/freezing point (ºC):** | 1535 (2795 ºF) |
| **Specific Gravity (water=1)** | not available |
| **Vapor Pressure (mmHg):** | not applicable |
| **Vapor Density (air = 1):** | not applicable |
| **Viscosity (cP):** | not applicable |
| **Solubility(ies):** | insoluble in water |
| **Partition coefficient (n-octanol/water):** | not available |
| **Particle Size:** | 45 to 100 µm |
| **Thermal Stability Properties:** |  |
| **Autoignition Temperature (ºC):** | not available |
| **Thermal Decomposition (ºC):** | not available |
| **Initial boiling point and boiling range (ºC):** | 2750 (4982 ºF) |
| **Explosive Limits, LEL (Volume %):** | not available |
| **Explosive Limits, UEL (Volume %):** | not available |
| **Flash Point (ºC):** | not available |
| **Flammability (solid, gas):** | not available |

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| **10. Stability and Reactivity** |

**Reactivity:** Stable at normal temperatures and pressure.

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| **Stability:** | X | Stable |  | Unstable |

**Possible Hazardous Reactions:** Dust/air mixtures may ignite or explode.

**Conditions to Avoid:** Avoid generating dust. Avoid heat flames, sparks and other sources of ignition.

**Incompatible Materials:** Oxidizers, acids, halogens, halogenated compounds, peroxides, metal salts.

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

**Hazardous Decomposition:** Combustion will produce oxides of iron.

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

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| **11. TOXICOLOGICAL INFORMATION** |

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| **Route of Exposure:** | X | Inhalation | X | Skin |  | Ingestion |

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Generated dust may cause irritation if inhaled.

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

**Inhalation:** Dust may cause irritation due to mechanical action. Chronic exposure may result in mottling of the lungs, a condition known as siderosis, chronic bronchitis, emphysema, and dyspnea.

**Skin Contact:** May cause mechanical irritation.

**Eye Contact:** May cause mechanical irritation. Chronic exposure may cause conjunctivitis.

**Ingestion:** Absorption of elemental iron in doses greater than 20 mg/kg may produce symptoms; doses greater than 60 mg/kg may produce significant toxicity, and doses greater than 180 mg/kg may be lethal. Chronic or repeated exposure may cause hemosiderosis or hemochromatosis.

**Numerical Measures of Toxicity:**

**Acute Toxicity:** Not classified.

Rat, Oral LD50: 30 g/kg

**Skin Corrosion/Irritation:** Not classified; no data available.

**Serious Eye damage/ Eye irritation:** Not classified; no data available.

**Respiratory Sensitization:** Not classified; no data available.

**Skin Sensitization:** Not classified; no data available.

**Germ Cell Mutagenicity:** Not classified; no data available.

**Tumorigenic:** Not classified.

Rat, Intertracheal TDLo: 450 mg/kg (15 weeks)

**Carcinogenicity:** Not classified.

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| **Listed as a Carcinogen/Potential Carcinogen** |  | Yes | X | No |

Iron is not listed by NTP, IARC or OSHA as a carcinogen.

**Reproductive Toxicity:** Not classified; no data available.

**Specific Target Organ Toxicity, Single Exposure:** Not classified; no data available.

**Specific Target Organ Toxicity, Repeated Exposure:** Not classified; no data available.

**Aspiration Hazard:** Not classified; no data available.

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| **12. ECOLOGICAL INFORMATION** |

**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** |

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

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| **14. TRANSPORTATION INFORMATION** |

**U.S. DOT and IATA:** Not regulated by DOT or IATA.

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| **15. REGULATORY INFORMATION** |

**U.S. Regulations:**

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

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:** Not listed.

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

**Canadian Regulations:**

WHMIS Information: Not provided for this material.

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| **16. OTHER INFORMATION** |

**Issue Date:** 27 May 2014

**Sources:** ChemADVISOR, MSDS, *Iron powder*, 21 March 2014.

29 CFR Occupational Health and Safety Office (OSHA) 1910.1000, *Limits for Air Contaminants*, *Table Z-1*; available at  
<http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992> (accessed May 2014).

Center for Disease Control (CDC) NIOSH Pocket Guide to Chemical Hazards, *Particulates not otherwise regulated*; available at <http://www.cdc.gov/niosh/npg/npgd0480.html> (accessed May 2014).

**Key of Acronyms:**

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| 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 Transportation Agency | 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 |

**Disclaimer:** Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

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; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.