NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

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SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

SRM Number: 2448
SRM Name: Mercury in Brominated Activated Carbon
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 the evaluation of chemical methods of analysis for mercury in halogenated activated carbon sorbents. A unit of SRM 2448 consists of 25 g of brominated activated carbon ground to pass a 250 μm (60 mesh) sieve, homogenized, and packaged in an amber glass bottle.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
E-mail: SRMMSDS@nist.gov
Website: https://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Note: This material is intended for laboratory use only. SRM 2448 is supplied in a small quantity and under normal laboratory conditions, it does not constitute a combustible dust hazard. The physical properties of this material indicate that accumulated dust on surfaces, may lead to combustible dust concentrations in air.

Classification

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

Label Elements

Symbol: No Symbol/No Pictogram.

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: Carbon (activated)

Other Designations: Fine carbon (brominated activated carbon)

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

Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Carbon	7440-44-0	231-153-3	≥97
Bromine	7726-95-6	231-778-1	≤3

4. First Aid Measures

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. If necessary, seek medical attention.

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

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

Most Important Symptoms/Effects, Acute and Delayed: Generated dust may cause mechanical 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.

5. Fire Fighting Measures

Fire and Explosion Hazards: Slight 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: Regular dry chemical, carbon dioxide, water, regular foam.

Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Not applicable.

Special Protective Equipment and Precautions for Fire-Fighters: Move container from fire area if it can be done without personal risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

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. Avoid generating dust.

7. Handling and Storage

Safe Handling Precautions: Use suitable personal protection equipment (PPE). See Section 8, "Exposure Controls and Personal Protection".

Storage and Incompatible Materials: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (see Section 10, "Stability and Reactivity").

8. Exposure Controls and Personal Protection

Exposure Limits			
Components	**OSHA (PEL)**	**ACGIH (TLV)**	**NIOSH (REL)**
Carbon[(a)]	TWA: 15 mg/m^3 (total particulates) TWA: 5 mg/m^3 (respirable particulates)	no occupational limits established.	TWA: 5 mg/m^3 (respirable particulates) TWA: 10 mg/m^3 (total particulates)
Bromine	TWA: 0.7 mg/m^3 (0.1 ppm)	TWA: 0.1 ppm STEL: 0.2 ppm	TWA: 0.7 mg/m^3 (0.1 ppm) STEL: 2 mg/m^3 (0.3 ppm) IDLH: 3 ppm

[(a)] No occupational exposure limits have been established for activated carbon. 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.

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

Personal Protection Measures: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate 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: Eye and face protection is required when dust is generated. Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin and Body Protection: Standard PPE is recommended to avoid irritation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties

Appearance (physical state, color, etc.)	black amorphous powder
Molecular Formula	not applicable
Molar Mass (g/mol)	not applicable
Odor	odorless
Odor threshold	not available
pH	not available
Evaporation rate	not available
Melting point/freezing point	3550 °C to 3697 °C (6422 °F to 6687 °F)
Density	0.04 g/mL to 0.7 g/mL
Vapor Pressure	<0.1 mmHg at 20 °C
Vapor Density (air = 1)	0.4
Viscosity	not available
Solubilities	insoluble in water, acids, and alkali
Partition coefficient (n-octanol/water)	not available
Particle Size	<290 μm (20 mesh to 50 mesh)

Thermal Stability Properties

Autoignition Temperature	450 °C (842 °F)
Thermal Decomposition	not available
Initial boiling point and boiling range	4200 °C (7592 °F)
Explosive Limits, LEL (Volume %)	not available
Explosive Limits, UEL	0.14 g/L
Flash Point	slightly flammable
Flammability (solid, gas)	not applicable

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: __X__ Stable _____ Unstable

Possible Hazardous Reactions: Large amounts of activated carbon, especially when wet, may deplete oxygen from surrounding air. This may cause a dangerously low oxygen level in confined or enclosed spaces. Use appropriate confined space entry precautions and monitor oxygen levels.

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

Incompatible Materials: Metals, oxidizing materials, halogens, combustible materials, peroxides, acids, reducing agents.

Hazardous Decomposition: Oxides of carbon and bromine.

Hazardous Polymerization: _____ Will Occur __X__ Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin X Ingestion

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

Potential Health Effects (Acute, Chronic, and Delayed)

Inhalation: Inhalation of dust may cause irritation. Repeated or prolonged exposure may cause irritation, weight loss, weakness, pulmonary edema, decreased pulmonary function, and eventual lung damage.

Skin Contact: Skin exposure may result in mechanical irritation.

Eye Contact: Direct contact may cause mechanical irritation.

Ingestion: Ingestion of this material is unlikely under normal conditions of use. Ingestion of large amounts may cause gastrointestinal irritation with nausea, vomiting, and stomach pain.

Numerical Measures of Toxicity

Acute Toxicity: Not classified.
Brominated, activated carbon: Rat, Oral LD50: >2 000 mg/kg
Carbon: Rat, Oral LD50: >10 000 mg/kg
Bromine: Rat, Oral LD50: 1700 mg/kg; Rat, Inhalation LC50: 2700 mg/m^3

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.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen ____ **Yes** X **No**
Carbon and bromine are not listed by IARC, NTP, or OSHA as carcinogens/potential carcinogens.

Reproductive Toxicity: Not classified.
Carbon: Rat Subcutaneous TDLo: 167 mg/kg (pregnant 8 d)

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 applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data available.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No bioaccumulation expected for bromine.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. U.S. EPA 40 CFR 262 Hazardous waste number(s): D001, D002 for bromine and D001 for carbon.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: This material is not regulated by DOT or IATA. Special Provision A3 applies.

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): Bromine: 500 lb TPQ.

SARA Title III Section 304 (40 CFR 355.40): Bromine: 500 lb EPCRA RQ.

SARA Title III Section 313 (40 CFR 372.65): Bromine: 1 % de minimis concentration.

OSHA Process Safety (29 CFR 1910.119): Bromine: 1500 lb TQ.

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: Activated carbon and bromine are listed.

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

Canadian Regulations: WHMIS Information is not provided for this material.

16. OTHER INFORMATION

Issue Date: 24 September 2024

Sources: ChemADVISOR, Inc., SDS *Carbon, Activated*, 09 December 2015.

ChemADVISOR, Inc., SDS *Bromine*, 09 December 2015.

Vendor MSDS, 23 December 2009.

CDC; NIOSH; *NIOSH Pocket Guide to Chemical Hazards*; Department of Health and Human Services (DHHS), Centers for Disease Control and Prevention (CDC), National Institute for Safety and Health; *Particulates Not Otherwise Regulated*, 30 October 2019; available at https://www.cdc.gov/niosh/npg/npgd0480.html (accessed Sep 2024).

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
NIOSH	National Institute for Occupational Safety and Health	TWA	Time Weighted Average
NIST	National Institute of Standards and Technology	UEL	Upper Explosive Limit
		WHMIS	Workplace Hazardous Materials Information System

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