Date of Issue:
29 April 2015

SAFETY DATA SHEET

1. Substance and Source Identification

Product Identifier

SRM Number: 2203
SRM Name: Potassium Fluoride (Standard for Ion-Selective Electrodes)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is intended for the standardization of fluoride ion-selective electrodes. A unit of SRM 2203 consists of 125 g of potassium fluoride of analytical reagent-grade purity.

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
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: http://www.nist.gov/srm

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

2. Hazards Identification

Classification

Physical Hazard: Not classified.
Health Hazard: Acute Toxicity, Oral, Dermal, Inhalation Category 3

Label Elements

Symbol

Signal Word

DANGER

Hazard Statement(s)

H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.

Precautionary Statement(s)

P260	Avoid breathing dusts, fumes, mists, vapors, or spray.
P264	Wash hands thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves and clothing.
P301+P330	If swallowed: Immediately call a doctor. Rinse mouth.
P302+P361+P353	If on skin: Wash with plenty of water. Take off immediately all contaminated clothing and wash it before reuse.
P304+P340	If inhaled: Remove person to fresh air and keep comfortable for breathing.
P310	Call a doctor.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents and container according to local regulations.

Hazards Not Otherwise Classified: Not applicable.

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

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Potassium fluoride

Other Designations: Potassium monofluoride; clocat F; KF

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

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Potassium fluoride	7789-23-3	232-151-5	100

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 for at least 15 minutes while removing contaminated clothing and shoes. Get immediate medical attention. Thoroughly clean and dry contaminated clothing before reuse. Destroy contaminated shoes.

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

Ingestion: Contact a poison control center immediately for instructions. Do not induce vomiting. Give water to rinse out mouth. Never give liquids to a person with reduced awareness or becoming unconscious. If vomiting occurs, keep head lower than hips to prevent aspiration. If not breathing, give artificial respiration by qualified personnel. Seek immediate medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Inhalation, ingestion or skin contact may result in severe injury or death.

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

5. FIRE FIGHTING MEASURES

Fire and Explosion Hazards: Negligible fire hazard. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:

Suitable: Regular dry chemical, carbon dioxide, water, and regular foam.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: Miscellaneous decomposition products.

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 = 3 Fire = 0 Reactivity = 0

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: Immediately contact emergency personnel. Keep unnecessary personnel away. 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. Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Keep unnecessary people away, isolate hazard area and deny entry.

7. HANDLING AND STORAGE

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

Storage: 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: (as F, related to Fluorides)

ACGIH (TLV): 2.5 mg/m^3 TWA
OSHA (PEL): 2.5 mg/m^3 TWA
NIOSH (REL): 2.5 mg/m^3 TWA
250 mg/m^3 IDLH

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 eyewash 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties	**Potassium fluoride**
Appearance (physical state, color, etc.)	white deliquescent crystalline powder.
Molecular Formula	KF
Molar Mass (g/mol)	58.10
Odor	odorless
Odor threshold	not available
pH	(acidic in solution)
Evaporation rate	not available
Melting point/freezing point	860 ºC (1580 ºF) [(a)]
Relative Density as specific gravity (water = 1)	2.48[(a)]
Vapor Pressure	1 mmHg at 885 °C
Vapor Density (air = 1)	not available
Viscosity	not available
Solubility(ies)	soluble in water [48 % at 18 °C][(a)], hydrofluoric acid, and ammonia. insoluble in alcohol.
Partition coefficient (n-octanol/water)	not available
Particle Size	not available

Thermal Stability Properties	Potassium fluoride
Autoignition Temperature	not available
Thermal Decomposition	not available
Initial boiling point and boiling range	1505 ºC (2741 ºF) [a]
Explosive Limits, LEL (Volume %)	not available
Explosive Limits, UEL (Volume %)	not available
Flash Point	not available
Flammability (solid, gas)	not available

[a] Vendor supplied physical data.

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid heat, flames, sparks and other sources of ignition. Avoid contact with incompatible materials.

Incompatible Materials: Acids, metals, and halogens.

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

Hazardous Decomposition: Thermal decomposition will produce potassium oxide, fluorine, hydrogen fluoride.

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: Inhalation, ingestion or skin contact may result in severe injury or death.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Acute inhalation of dust may cause irritation with coughing and shortness of breath, nausea, laryngeal and pulmonary edema, and aggravate asthma. Systemic poisoning as detailed in acute ingestion may occur. Chronic exposure may cause nosebleeds hoarseness, sore throat, sinus trouble, and asthma. Hydrogen fluoride, a corrosive substance may be formed.

Skin Contact: Skin contact may result in irritation.

Eye Contact: Exposure may result in strong irritation.

Ingestion: In the presence of moisture, corrosive hydrogen fluoride may be formed, especially in the stomach. Symptoms may include a burning sensation in the mouth and abdomen, sore tongue, a salty or soapy taste, nausea, vomiting, diarrhea, and weight loss. Intense epigastric pain, deep ulceration of the esophagus and mucous membranes, hematemesis and hematuria may also be present. Other symptoms may include spasms of the extremities, albuminaria, visual disturbances, mental deterioration, and coma. Chronic ingestion may cause fluorosis characterized by nausea, vomiting, anorexia, diarrhea, and weakness.

Numerical Measures of Toxicity

Acute Toxicity: Category 3, Oral, Dermal, Inhalation.
Rat, Oral LD50: 245 mg/kg
Inhalation, ingestion or skin contact may result in severe injury or death.

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
Potassium fluoride is not listed by NTP, IARC or OSHA as carcinogens/potential carcinogens.

Reproductive Toxicity: Not classified.
Mouse, Intraperitoneal TDLo: 1050 mg/kg (pregnant 1 d to 21 d)

Specific Target Organ Toxicity, Single Exposure: No data available.

Specific Target Organ Toxicity, Repeated Exposure: No data available.

Aspiration Hazard: No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: Fish, Grass carp (*Ctenopharyngodon idella*) LC50: 9.3 mg/L (96 h)

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

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.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: UN1812; Potassium fluoride, solid; Hazard Class 6.1; Packing Group III.

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:	Yes
CHRONIC HEALTH:	Yes
FIRE:	No
REACTIVE:	No
PRESSURE:	No

State Regulations: Not listed under California Proposition 65.

U.S. TSCA Inventory: Listed.

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

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

16. OTHER INFORMATION

Issue Date: 29 April 2015

Sources: ChemAdvisor, Inc., SDS *Potassium Fluoride*, 20 March 2015.

Allied Chemical, An Allied Company, Vendor Product SDS *Potassium Fluoride Crystals*, May 1982.

OSHA, *Chemical Sampling Information*; *Fluorides (as F)*, 06 September 2012; available at https://www.osha.gov/dts/chemicalsampling/data/CH_242300.html (accessed Apr 2015).

Hazardous Substances Data Bank (HSDB), National Library of Medicine's TOXNET system, *Potassium Fluoride CAS No. 7789-23-3*; available at http://toxnet.nlm.nih.gov (accessed Apr 2015).

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 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 %	STOT	Specific Target Organ Toxicity
LEL	Lower Explosive Limit	TLm	Threshold Limit, median
MSDS	Material Safety Data Sheet	TLV	Threshold Limit Value
NFPA	National Fire Protection Association	TPQ	Threshold Planning Quantity
NIOSH	National Institute for Occupational Safety and Health	TSCA	Toxic Substances Control Act
NIST	National Institute of Standards and Technology	TWA	Time Weighted Average
n.o.s.	Not Otherwise Specified	UEL	Upper Explosive Limit
		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.