

# MATERIAL SAFETY DATA SHEET

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## 1. SUBSTANCE AND SOURCE IDENTIFICATION

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

**SRM Number: 3192  
MSDS Number: 3192  
SRM Name: Aqueous Electrolytic  
Conductivity Standard  
Date of Issue: 29 June 2006**

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**Description:** This Standard Reference Material (SRM) is intended primarily for use in electrolytic conductivity measurement as a calibration standard or control sample. As a calibration standard, it can be used to determine the conductivity cell constant. One unit of SRM 3192 consists of eight glass ampoules, each containing approximately 50 mL of an aqueous solution of KCl in equilibrium with atmospheric carbon dioxide.

**Substance:** Potassium Chloride

**Other Designations:** Potassium monochloride; monopotassium chloride; potassium muriate; potash muriate; KCl.

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## 2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

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<b>Component:</b>	Potassium Chloride
<b>CAS Number:</b>	7447-40-7
<b>EC Number (EINECS):</b>	231-211-8
<b>Nominal Mass Fraction (%):</b>	N/A
<b>EC Classification:</b>	Xn (Harmful); not classified in Annex I of Directive 67/548/EEC
<b>EC Risk:</b>	R22 (harmful if swallowed) R36/37/38 (irritating to eyes, respiratory system and skin)
<b>EC Safety:</b>	S24/25 (avoid contact with skin and eyes)

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## 3. HAZARDS IDENTIFICATION

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**NFPA Ratings (Scale 0-4):** Health = 1    Fire = 0    Reactivity = 0

**Major Health Hazards:** This material can irritate the skin, eyes, and respiratory system. It may be harmful if swallowed.

**Physical Hazards:** Glass container may break or shatter.

## Potential Health Effects

- Inhalation:** Aspiration of KCl aqueous solution is unlikely under normal conditions of use. KCl dust (not present in this SRM) may irritate the upper respiratory tract.
- Skin Contact:** This material may cause skin irritation with redness and pain.
- Eye Contact:** Contact with this solution may cause eye irritation with redness and pain.
- Ingestion:** Ingestion of potassium chloride may cause nausea, vomiting, diarrhea, and stomach pain. A large dose or prolonged exposure may cause potassium poisoning, with changes in blood pressure, irregular heartbeat, drowsiness, dizziness, disorientation, internal bleeding, and paralysis. These effects are highly unlikely under normal conditions of use.

**Medical Conditions Aggravated by Exposure:** Hyperkalemia; kidney disease (makes it harder to eliminate excess potassium); pre-existing conditions affecting any of the target organs, such as conjunctivitis or dermatitis.

### Listed as a Carcinogen/ Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	_____	<u>  X  </u>
In the International Agency for Research on Cancer (IARC) Monographs	_____	<u>  X  </u>
By the Occupational Safety and Health Administration (OSHA)	_____	<u>  X  </u>

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## 4. FIRST AID MEASURES

**Inhalation:** Move the person to fresh air immediately. Get medical aid if irritation persists or if breathing difficulty develops.

**Skin Contact:** Remove contaminated clothing. Wash affected skin with soap and water. If irritation persists, get medical aid and bring the container or label. Wash contaminated clothing before reusing.

**Eye Contact:** Remove contact lenses (if any). Flush eyes with running water for at least 15 minutes, keeping eyelids open and raising lids to remove all chemical. If irritation persists, get medical aid, and bring the container or label.

**Ingestion:** If a large dose was ingested and symptoms appear (see Section 3), contact a poison control center for instructions. Do not induce vomiting except on the advice of qualified medical personnel. Get medical aid if necessary, and bring the container or label.

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## 5. FIRE FIGHTING MEASURES

**Fire and Explosion Hazards:** Potassium chloride alone is not flammable or explosive, but it can form an explosive mixture with sulfuric acid and potassium permanganate. In a fire, small amounts of chlorine gas may be released.

**Extinguishing Media:** Use extinguishing media appropriate to the surrounding fire: water spray, dry chemical, carbon dioxide, or foam.

**Fire Fighting:** Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**Flash Point (°C):** N/A

**Autoignition (°C):** N/A

**Lower Explosive Limit (LEL):** N/A

**Upper Explosive Limit (UEL):** N/A

**Flammability Class (OSHA):** N/A

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## 6. ACCIDENTAL RELEASE MEASURES

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**Occupational Release:** Isolate the spill area and absorb spilled liquid with sand or other non-combustible material. Cleanup personnel should wear personal protective equipment (Section 8). Place material in a suitable container for disposal.

**Disposal:** Refer to Section 13, Disposal Considerations.

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## 7. HANDLING AND STORAGE

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**Storage:** Store in tightly closed container in a cool, dry, well-ventilated place and protect from mechanical damage. Keep away from incompatible materials. See also Section 10.

**Safe Handling Precautions:** Wear suitable gloves, or wash hands after contact.

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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**Exposure Limits:** No airborne exposure limits have been established for aqueous KCl solution.

**Ventilation:** Use local or general exhaust to keep employee exposures below limits. Local exhaust ventilation is preferred because it can control contaminant emissions at the source, preventing dispersion into the general work area. Refer to the ACGIH document *Industrial Ventilation, a Manual of Recommended Practices*.

**Respirator:** If necessary, refer to the *NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84* for selection and use of respirators certified by NIOSH.

**Eye Protection:** Use chemical safety goggles where dusting or splashing of solutions may occur. See OSHA standard (29 CFR 1910.133) or European Standard EN166. The employer should provide an emergency eye wash fountain and safety shower in the immediate work area.

**Personal Protection:** Wear appropriate gloves and protective clothing to minimize contact with skin.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**Component:** Potassium Chloride

**Appearance and Odor:** White crystals or granules, no odor

**Relative Molecular Weight:** 74.55

**Molecular Formula:** KCl

**Density (g/cm<sup>3</sup>):** 1.984

**Solvent Solubility:** Soluble in glycerol, alkali, ether; slightly soluble in alcohol; insoluble in acetone.

**Water Solubility:** Soluble (23.8 % @ 20 °C)

**Boiling Point (°C):** 1413 (2575 °F)

**Melting Point (°C):** 770 (1418 °F)

**Vapor Pressure (Pa):** N/A

**Vapor Density (Air = 1):** N/A

**Critical Solution Temperature:** N/A

**pH:** 5.4–8.6 (5 % solution)

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## 10. STABILITY AND REACTIVITY

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**Stability:**     Stable             Unstable

Stable at normal temperatures and pressure.

**Conditions to Avoid:** Physical damage, direct sunlight, and freezing; prolonged exposure to air (evaporation will change conductivity); exposure to acid fumes, nitrogen oxides, or sulfur dioxide (may contaminate material).

**Incompatible Materials:** An explosive reaction may occur with bromine trifluoride, other halogens, or sulfuric acid + potassium permanganate. KCl is also incompatible with iron and cement (corrosion may occur), nitric acid (may release nitrosyl chloride), or any strong acids (may release chlorine gas).

**Fire/Explosion Information:** See Section 5.

**Hazardous Decomposition:** Thermal decomposition of KCl may produce chlorine gas and potassium oxide.

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

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Entry:**     Inhalation                     Skin                     Ingestion

**Toxicity Data:**

Rat, oral: LD<sub>50</sub> = 2600 mg/kg

Mouse, oral: LD<sub>50</sub> = 1500 mg/kg

Man, oral: LD<sub>Lo</sub> = 20 mg/kg

Woman, oral: LD<sub>Lo</sub> = 60 mg/kg/day

Rabbit, eye: 500 mg (24 hrs) caused mild irritation

**Target Organ(s):** GI tract, skin, eyes.

**Mutagen/Teratogen:** This material is not considered to be a human reproductive hazard.

**Health Effects:** See Section 3.

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## 12. ECOLOGICAL INFORMATION

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**Ecotoxicity Data:**

Carp (*Cyprinus carpio*): LC<sub>50</sub> (5 hrs) = 12,500 mg/L

Mosquitofish (*Gambusia affinis*): LC<sub>50</sub> (96 hrs) = 920 mg/L

Water flea (*Daphnia magna*): EC<sub>100</sub> (24 hrs) = 1010 mg/L

**Environmental Fate:** If released to the environment, this material can persist in natural water.

**Environmental Summary:** Potassium chloride is not acutely toxic to most aquatic organisms, but its environmental effects have not been fully evaluated.

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## 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose of container and unused contents in accordance with federal, state, and local requirements, which vary according to location. Although this material is not a listed RCRA hazardous waste, it may exhibit one or more characteristics of a hazardous waste and thus requires appropriate analysis to determine specific disposal requirements. Processing, use, or contamination of this product may change the waste management options.

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## 14. TRANSPORTATION INFORMATION

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U.S. DOT and IATA: Not regulated.

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## 15. REGULATORY INFORMATION

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### U.S. REGULATIONS

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

SARA Title III Section 302: Not regulated.

SARA Title III Section 304: Not regulated.

SARA Title III Section 313: Not regulated.

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

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

ACUTE:	Yes
CHRONIC:	No
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

### STATE REGULATIONS

California Proposition 65: Not regulated.

### CANADIAN REGULATIONS

WHMIS Classification: Not regulated; D2B, materials causing other toxic effects.

WHMIS Ingredient Disclosure List: Not listed.

CEPA Domestic Substances List (DSL): Listed.

### EUROPEAN REGULATIONS

EU/EC Classification: Xn (Harmful); not classified in Annex I of Directive 67/548/EEC

### NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed

TSCA 12(b), Export Notification: Not listed

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## 16. OTHER INFORMATION

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### Sources:

IUCLID Chemical Data Sheet: Potassium Chloride. European Chemicals Bureau, 19 Feb 2000.

PAN Pesticides Database: Potassium Chloride.

U.S. National Institute for Occupational Safety and Health, *NIOSH Pocket Guide to Chemical Hazards*, September 2005 edition. DHHS (NIOSH) Publication No. 2005-151.

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