



MATERIAL SAFETY DATA SHEET

Prepared in accordance with ISO 11014-1/ ANSI standard
Z400.1-2004

Revision Date: 02/March/2009

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Potassium Formate

Synonyms: KFormate; Formic acid, potassium salt

Use of the Substance/Preparation: Drilling fluids, Industrial Products

Supplier:

| | | |
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| Cabot Specialty Fluids Waterway Plaza Two 10001 Woodloch Forest Drive Suite 275 The Woodlands, TX 77380 UNITED STATES Tel: 1-281-298-9955 Fax: 1-281-298-6190 | Tantalum Mining Corporation of Canada, Ltd. Bernic Lake Box 2000 Lac du Bonnet, MB R0E 1A0 CANADA Tel: 1-204-884-2400 Fax: 1-204-884-2211 | Cabot Specialty Fluids Ocean House Hareness Circle Altens Industrial Estate Aberdeen AB12 3LY SCOTLAND Tel: (+44) 1224-897229 Fax: (+44) 1224-870089 |
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Emergency Telephone Number: US: CHEMTREC 1-800-424-9300 or 1-703-527-3887
US: Other 1-978-663-3455
Canada: CANUTEC 1-613-996-6666

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW - CAUTION: White powder. May cause skin, eye and respiratory tract irritation. Avoid contact with skin and eyes. Avoid breathing dust.

Principle Routes of Exposure: Inhalation, Eye contact, Skin contact, Ingestion

POTENTIAL HEALTH EFFECTS

Eye Contact: May cause irritation. Avoid contact with eyes.

Skin Contact: May cause irritation. Avoid contact with skin.

Inhalation: Dust may be irritating to respiratory tract. Do not breathe dust.

Ingestion: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Low hazard for usual industrial or commercial handling.

Carcinogenic Effects: Does not contain any substances listed by IARC (International Agency for Research on Cancer), NTP (National Toxicology Program), OSHA (Occupational Safety and Health Administration), ACGIH (American Conference for Governmental Industrial Hygienists) or EU (European Union). See also Section 11.

Target Organ Effects: Eyes, Skin, Respiratory system

Medical Conditions Aggravated by Exposure: None under normal use

Potential Environmental Effects: No special environmental precautions required. See also Section 12.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Chemical Name | CAS Number | EINECS/ELINCS Number | Weight % | EU Classification |
|-----------------------------|------------|----------------------|----------|-------------------|
| Formic acid, potassium salt | 590-29-4 | 209-677-9 | 97-98 | None |
| Other alkali formates | Various | Not assigned | < 3 | None |

4. FIRST AID MEASURES

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| Skin Contact: | Wash thoroughly with soap and water. Remove contaminated clothing and shoes. Seek medical attention if redness, swelling, itching, or burning occurs. |
| Eye Contact: | Flush eyes immediately with large amounts of water for 15 minutes. Seek medical attention if redness, swelling, itching, burning or visual disturbances occur. |
| Inhalation: | If cough, shortness of breath or other breathing problems occur, move to fresh air. Seek medical attention if symptoms persist. If necessary, restore normal breathing through standard first aid measures. |
| Ingestion: | Do not induce vomiting. If conscious, give several glasses of water. Never give anything by mouth to an unconscious person. Seek medical attention. |
| Notes to Physician: | Treat symptomatically. |

5. FIRE AND IGNITION INFORMATION

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| Flash Point: | Not determined |
| Explosion Limits in Air - Upper (g/m³): | Not determined |
| Explosion Limits in Air - Lower (g/m³): | Not determined |
| Extinguishing Media: | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Special Protective Equipment for Firefighters: | Wear suitable protective equipment. In the event of fire, wear self-contained breathing apparatus. |
| Specific Hazards: | Burning produces irritant fumes. |
| Hazardous Decomposition and/or Combustion Products: | Carbon monoxide, Carbon dioxide, Mixture of inorganic salts. |
| Risk of Dust Explosion: | Dust may form explosive mixture in air. |

6. ACCIDENTAL RELEASE MEASURES

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| Personal Precautions: | Avoid dust formation. Ensure adequate ventilation. Use personal protective equipment. See also Section 8. |
| Methods for Cleaning Up: | Do not create a dust cloud by using a brush or compressed air. Clean up promptly by vacuum. Use a suitable vacuum cleaner. Pick up and transfer to properly labelled containers. See Section 13. |
| Environmental Precautions: | Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained. See also Section 13. |

7. HANDLING AND STORAGE

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| Handling: | Avoid contact with skin and eyes. Avoid dust formation. Do not breathe dust. Provide appropriate exhaust ventilation at machinery and at places where dust can be generated. |
| Storage: | Hygroscopic material. Will absorb water readily from atmosphere. Keep away from humid air and water. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep in properly labeled containers. Do not store together with strong oxidizing agents. |

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

There are no exposure limits identified for this product. Exposure limits for dust are stated below.

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| Dust, or Particulates Not Otherwise Specified: | US ACGIH - TLV: | 10 mg/m ³ , TWA, Inhalable 3 mg/m ³ , TWA, Respirable |
| | US OSHA - PEL: | 15 mg/m ³ , TWA, Total inhalable 5 mg/m ³ , TWA, Respirable |
| | Belgium: | 10 mg/m ³ , TWA, Inhalable 3 mg/m ³ , TWA, Respirable |
| | Germany - TRGS 900: | 10 mg/m ³ , TWA, Inhalable 3 mg/m ³ , Respirable fraction |
| | Ireland: | 10 mg/m ³ , TWA, Total inhalable 4 mg/m ³ , TWA, Respirable |
| | Italy: | 10 mg/m ³ , TWA, Inhalable 3 mg/m ³ , TWA, Respirable |
| | Spain: | 10 mg/m ³ , VLA, Inhalable 3 mg/m ³ , VLA, Respirable |
| | Sweden: | 10 mg/m ³ , NGV, Total inhalable 5 mg/m ³ , NGV, Respirable |
| | The Netherlands: | 10 mg/m ³ , TGG, Inhalable 5 mg/m ³ , TGG, Respirable |

ACGIH: American Conference of Governmental Industrial Hygienists

NIOSH: National Institute for Occupational Safety and Health

OSHA: Occupational Health and Safety Administration

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

TLV: Threshold Limit Value

TWA: Time Weighted Average

MAK: Maximale Arbeitsplatzkonzentration

OES: Occupational Exposure Standard

TRGS: Technische Regeln für Gefahrstoffe

(Technical Rule for Hazardous Materials)

ENGINEERING CONTROLS

Ensure adequate ventilation to maintain exposures below occupational limits.

PERSONAL PROTECTIVE EQUIPMENT

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| Respiratory Protection: | Approved respirator may be necessary if local exhaust ventilation is not adequate. |
| Hand Protection: | Wear as appropriate. Impervious gloves. Neoprene gloves. Nitrile rubber gloves. Rubber gloves. PVC or other plastic material gloves. |
| Eye Protection: | Wear eye/face protection. Safety glasses with side-shields. Goggles. |
| Skin and Body Protection: | Wear suitable protective clothing. |

Other: Handle in accordance with good industrial hygiene and safety practice. Emergency eyewash and safety shower should be located nearby.

9. PHYSICAL AND CHEMICAL PROPERTIES

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|---|--------------------------------------|
| Appearance: | White Powder |
| Odor: | None |
| pH: | 6.5-11 when dissolved in water |
| Vapor Pressure: | Not applicable |
| Boiling Point/Range: | Not applicable |
| Melting Point/Range: | Not determined |
| Water Solubility: | 76.8% soluble at 20°C |
| Density: | 1.910 g/cm ³ |
| Specific Gravity: | Not determined |
| Evaporation Rate: | Not applicable |
| Viscosity: | Not applicable |
| Partition Coefficient (n-octanol/water): | < 0 (no potential to bioconcentrate) |

10. STABILITY AND REACTIVITY

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| Stability: | Stable |
| Hazardous Polymerization: | Hazardous polymerization does not occur. |
| Mechanical Sensitivity (shock): | Not sensitive to mechanical impact. |
| Conditions to Avoid: | Avoid contact with strong oxidizing agents. During long exposures to high temperatures, and in contact with certain catalysts, some liberation of gasses (H ₂ and CO) might occur. The greatest risk exists when dry formate powder is contacted by a platinum catalyst. Users are advised to obtain the Cabot Specialty Fluid's (CSF) Formate Technical Manual, Section A13 from a CSF representative for more detailed information on conditions to avoid. CSF does not recommend retorting formate solutions to determine solids content as temperatures may exceed 500 °C. The use of rupture disks is recommended as a precautionary measure when conducting heat aging of formate solutions at temperatures above 150 °C. |
| Hazardous Decomposition and/or Combustion Products: | Carbon dioxide, Carbon monoxide, Hydrogen, Mixture of inorganic salts, Potassium oxides. |
| Static Discharge Effects: | Avoid formation of dust and aerosols. Take precautionary measures against static discharges. |

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Oral LD50: LD50/oral/mouse = 5500 mg/kg.

Inhalation LC50: Not determined.

Dermal LD50: Not determined.

Eye Irritation: Draize: Maximum average irritation score: 32.7 @ 1 hr, 7.3 @ 24 hr, 0.7 @ 48 hr. Moderate eye irritation.

Skin Irritation: Primary irritation index = 0.3. Slight irritation.

SUBCHRONIC TOXICITY

Not determined.

CHRONIC TOXICITY

Carcinogenic Effects: Does not contain any substances listed by IARC (International Agency for Research on Cancer), NTP (National Toxicology Program), OSHA (Occupational Safety and Health Administration), ACGIH (American Conference for Governmental Industrial Hygienists) or EU (European Union).

OTHER

Mutagenic Effects: Not determined.

Reproductive Toxicity: Not determined.

Sensitizing Effects: Contains no known sensitizers.

Synergistic Materials: None reasonably foreseeable.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity:

MARINE

Juvenile turbot (*Scophthalmus maximus*) LC50 (96 hr) = 1700 mg/l

Marine algae (*Skeletonema costatum*) EbC50 (72 hr) = 3400 mg/l

Marine copepod (*Acartia tonsa*) LC50 (48 hr) = 300 mg/l

Brown shrimp (*Crangon crangon*) LC50 (96 hr) = 1300 mg/l

FRESHWATER

Rainbow trout (*Oncorhynchus mykiss*) LC50 (96 hr) = 3500 mg/l

Freshwater algae (*Scenedesmus subspicatus*) EbC50 (72 hr) = 1000 mg/l

Water flea (*Daphnia magna*) EC50 (48 hr) = 540 mg/l

Other Information:

In the majority of marine species, this material has not demonstrated toxicity and has received a rating of GOLD/SILVER/SILVER for drilling products and GOLD for Completion/Workover products under the PARCOM Harmonized Offshore and Chemical Notification Format (HOCNF).

ENVIRONMENTAL FATE

Mobility:

Highly soluble in water. Water solubility = 1200 g/L.

Bioaccumulation:

Log Pow = <0 (no potential to bioconcentrate). See also Section 9.

Persistence / Degradability:

Readily biodegradable
(Method: OECD 301D and 301E)

13. DISPOSAL CONSIDERATIONS

Disclaimer: Information in this section pertains to the product as shipped in its intended composition as described in Section 3 of this MSDS. Contamination or processing may change waste characteristics and requirements. Regulations may also apply to empty containers, liners or rinsate. State/provincial and local regulations may be different from federal regulations.

Unused and Uncontaminated Product: Product, as supplied, should be disposed of in accordance with the regulations issued by the appropriate federal, state and local authorities. Same consideration should be given to containers and packaging.

14. TRANSPORT INFORMATION

Not covered by International Regulation on the transport of Dangerous Goods (IMDG, IATA, ADR/RID).

UN Number: Not Regulated
UN Proper Shipping Name: Not classified
UN Shipping Class: Not classified
UN Packing Group: Not classified

IMO IBC Code:

Potassium Formate - Pollution Category Z, Pollution Hazard Only, Not Requiring a Chemical Tanker.

IMDG (International Maritime Organization's Dangerous Goods Code):

Not regulated.

IATA (International Air Transport Association):

Not regulated.

15. REGULATORY INFORMATION

Hazard Classification

United States - OSHA (29 CFR 1910.1200): Not hazardous.

Mexico - NOM-018-STPS-2000: Refer to HMIS Rating in Section 16.

Canada - WHMIS Classification (CPR, SOR/88-66): Not controlled.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International Inventories

All components of this product are listed on or exempt from the following inventories:

- YES - Australian Inventory of Chemical Substances (AICS)
- YES - Canadian Domestic Substances List (DSL)
- YES - Chinese Inventory
- YES - European Inventory of Existing Commercial Chemical Substances (EINECS)
- YES - Japanese Existing and New Chemical Substances (ENCS)
- YES - Korean Existing Chemicals List (KECL)
- YES - New Zealand Hazardous Substances and New Organisms Act (HSNO)
- NO - Philippines Inventory of Chemicals and Chemical Substances (PICCS)
- YES - United States Toxic Substances Control Act (TSCA) Inventory

U.S. Federal Regulations

TSCA 12(b) Export Notification: This product does not contain any components that are subject to TSCA 12(b) Export Notification.

Clean Air Act Amendments of 1990 (CAA, Section 112, 40 CFR 82): This product does not contain any components listed as a Hazardous Air Pollutant, Flammable Substance, Toxic Substance, or Class 1 or 2 Ozone Depletor.

Clean Water Act (CWA, 40 CFR 116) Priority Pollutants: This product does not contain any listed Priority Pollutants.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 40 CFR 302): This product does not contain any listed Hazardous Substances.

Superfund Amendments and Reauthorization Act, Title III (SARA):

SARA Section 302 (40 CFR 355) Extremely Hazardous Substances: No components are listed as extremely hazardous chemicals under SARA Section 302.

SARA Sections 311/312 (40 CFR 370) Hazard Category: This product does not meet any of the MSDS Requirement definitions for a hazardous material under SARA Sections 311/312.

SARA Section 313 (40 CFR 372) Toxics Release Inventory: Does not contain any of the substances identified under Section 313 as toxic chemicals in excess of the de minimis concentrations necessary to be subject to the supplier notification requirements.

Food and Drug Administration (FDA):
Not permitted

Pharmaceutical Information: Not permitted

U.S. State Regulations

California Proposition 65: This product does not contain any components listed on California Proposition 65.

US Coalition of NorthEastern Governors (CONEG) Metals List: This product meets the CONEG Source Reduction Council limits for the sum of the levels of lead, cadmium, mercury and hexavalent chromium of less than 100 parts per million by weight.

16. OTHER INFORMATION

HMIS Rating

HMIS Index: * - chronic, 0 - minimal, 1 - slight, 2 - moderate, 3 - serious, 4 - severe
Health: 1
Flammability: 0
Physical Hazard: 0

References:

MARPOL 73/78, Latest edition of Marine Environment Protection Committee (MEPC) Circulars MEPC.2/Circular, IBC Code, IMO Resolution A.673(16) Guidelines for the Transport and Handling of Limited Amounts of Hazardous and Noxious Liquid Substances in bulk on Offshore Support Vessels.

Additional Contacts:

Prepared by: Cabot Corporation - Safety, Health and Environmental Affairs
Revision Date: 02/March/2009
Previous Revision Date: 20/February/2009
Reason for Revision: Revision to Section(s) 5,10

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