

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE

Trade Name Electrolyte Solution, *ε-lectrolyte Gold*, *ε-lectrolyte Blue*,
ε-lectrolyte Black, DF-E05, DF-E06, DF-E07, DF-E09

Manufacturer Delta F Corp., 4 Constitution Way, Woburn, MA
01801-1087, USA, Tel + 1-781-935-4600

Emergency Contact USA: 1-800-424-9300
International: 1-813-979-0626 (collect)

Supplier and contact in UK (for use in the UK only)	
---	--

2. COMPOSITION

CAS #	Component	EC Code/class	Concentration	Risk Phrase	Risk Description
7732-18-5	Water	231-791-2			
1310-58-3	Potassium Hydroxide in aqueous solution	215-181-3 C	0.77N: 4.3%w/w	R35	Causes severe burns

3. HAZARDS IDENTIFICATION

Main Hazard Corrosive. Causes severe burns on contact with skin, eyes and mucous membrane

CERCLA Ratings (scale 0-3) Health = 3 Fire = 0 Reactivity = 1 Persistence = 0

NFPA Ratings (scale 0-4) Health = 3 Fire = 0 Reactivity = 1

Potential Health Effects:

Eye Contact Causes severe eye burns. May cause irreversible eye injury. Contact may cause ulceration of the conjunctiva and cornea. Eye damage may be delayed.

Skin Contact Causes skin burns. May cause deep, penetrating ulcers of the skin.

Ingestion May cause circulatory system failure. May cause perforation of the digestive tract. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death.

Inhalation Inhalation under normal use would not be expected as this product is supplied as an aqueous solution and no hazardous vapors are emitted. Effects of inhalation are irritation that may lead to chemical pneumonitis and pulmonary edema. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma.

Chronic Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis.

4. FIRST-AID MEASURES

Skin Contact In case of skin contact, remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water for at least 15 minutes. Obtain medical attention immediately.

Eye Contact	If the substance has entered the eyes, wash out with plenty of water for at least 15 - 20 minutes, occasionally lifting the upper and lower lids. Obtain medical attention immediately.
Ingestion	If the chemical has been confined to the mouth, give large quantities of water as a mouthwash. Ensure the mouthwash has not been swallowed. If the chemical has been swallowed, do NOT induce vomiting. Give 470 - 950ml (2 - 4 cups) of water or milk. Never give anything by mouth to an unconscious person. Obtain medical attention immediately.
Inhalation	Inhalation under normal use would not be expected as this product is supplied as an aqueous solution and no hazardous vapors are emitted; however, if inhalation should somehow occur, remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical aid immediately.

5. FIRE FIGHTING MEASURES

Special Exposure Hazard	Not applicable
Extinguishing Media	Not Combustible. Select extinguishing media appropriate to the surrounding fire conditions.
Protective Equipment	Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

6. ACCIDENTAL RELEASE MEASURES

Personal Protection	Use proper personal protective equipment as indicated in Section 8.
Leaks and Spills	Absorb spill with inert material (e.g., dry sand or earth), then place into a chemical waste container. Neutralize spill with a weak acid such as vinegar or acetic acid.
Clean-up Procedures	Wash the spillage site with large amounts of water.

7. HANDLING AND STORAGE

Handling Precautions	Complete eye and face protection, protective clothing, and appropriate gloves must be used. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not ingest or inhale.
Storage Precautions	Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Personal Protection	
Eyes	Wear appropriate protective chemical safety goggles and face shield as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
Skin	Wear appropriate gloves to prevent skin exposure.
Clothing	Wear appropriate protective clothing to prevent skin exposure.
Respirators	Not Applicable. Inhalation under normal use would not be expected

as this product is supplied as an aqueous solution and no hazardous vapors are emitted.

Airborne Exposure	This material is supplied as an aqueous solution and will not be present in the atmosphere in normal use.
Exposure Limits	Potassium Hydroxide UK EH40, OEL (8hr TWA) 2mg/m ³ NIOSH, (8hr TWA) 2mg/m ³ ACGIH, Ceiling 2mg/m ³ OSHA, not listed

9. Physical & Chemical Properties

Molecular Formula	KOH Mixture
Physical State	.77N aqueous solution. Colorless, odorless
pH	Alkaline
Solubility	Completely soluble in water
Boiling Point	104.5 ^o C
Melting Point	-3.5 ^o C
Flash Point	Not applicable
Flammability	Not flammable
Explosion Limits	Not applicable
Specific Gravity	1.15
Vapor Pressure	16.1 mm Hg @ 20 ^o C

10. Stability & Reactivity

Chemical Stability	Stable
Conditions/Materials to Avoid	Incompatible materials, acids and metals
Incompatibilities with other Materials	Reacts with chlorine dioxide, nitrobenzene, nitromethane, nitrogen trichloride, peroxidized tetrahydrofuran, 2,4,6-trinitrotoluene, bromoform+ crown ethers, acids alcohols, sugars, germanium cyclopentadiene, maleic dicarbide. Corrosive to metals such as aluminum, tin, and zinc to cause formation of flammable hydrogen gas.
Hazardous Decomposition Products	Oxides of potassium
Hazardous Polymerization	Has not been reported

11. Toxicological Information

RTECS#	CAS# 7732-18-5	ZC0110000
	CAS# 1310-58-3	TT2100000
LD50/ LC50	CAS# 7732-18-5	Oral, ret:LD50 = >90 ml/kg
	CAS# 1310-58-3	Draize test, rabbit, skin: 50 mg/24H Severe Oral, rat: LD50 = 273 mg/kg
Carcinogen Status	CAS# 7732-18-5	Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA
	CAS# 1310-58-3	Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA

Potassium Hydroxide Solution is a severe eye, mucus membrane, and skin irritant.

12. Ecological Information

Mobility	Completely soluble in water
Degradability	Will degrade by reaction with carbon dioxide from the atmosphere to produce a non-hazardous product.
Accumulation	No
Ecotoxicity	Information not available. No long-term effects expected due to degradation. The preparation is already in dilute solution and adverse aquatic effects are not expected due to further dilution. The preparation is corrosive, and direct contact with fauna will cause burns.

13. Disposal Considerations

Waste Disposal	Dispose of in a manner consistent with federal, state, and local regulations.
-----------------------	---

14. Transportation Information

	Shipping Name	Hazard Class	UN Number	Packaging Group
US DOT	Potassium Hydroxide Solution	8	UN1814	II
IATA	Potassium Hydroxide Solution	8	UN1814	II
ADR/RID	Potassium Hydroxide Solution	8	UN1814	II
IMDG Code	Potassium Hydroxide Solution	8	UN1814	II
Canadian TDG	Potassium Hydroxide Solution	8(9.2)	UN1814	Not Available

15. Regulatory Information

US FEDERAL

TSCA	CAS# 7732-18-5	Listed on TSCA Inventory
	CAS# 1310-58-3	Listed on TSCA Inventory
Health & Safety Reporting List		None of the chemicals on Health & Safety Reporting List
Chemical Test Rules		None of the chemicals are under Chemical Test Rule
Section 12b		None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule		None of the chemicals have a SNUR under TSCA
CERCLA Hazardous Substances and corresponding RQ's	CAS# 1310-58-3	1000 lb final RQ; 454kg final RQ
SARA Section 302		None of the chemicals have a TQP

Extremely Hazardous Substances

SARA Codes	CAS# 1310-58-3	Immediate, Reactive
Section 313		No chemicals are reportable under Section 313
Clean Air Act		Does not contain any hazardous air pollutants Does not contain any Class 1 Ozone depletors Does not contain any Class 2 Ozone depletors
Clean Water Act	CAS# 1310-58-3	Listed as a Hazardous Substance under the CWA None of the chemicals are listed as Priority Pollutants under the CWA None of the chemicals are listed as Toxic Pollutants under the CWA
OSHA		None of the chemicals are considered highly hazardous by OSHA
STATE	CAS# 7732-18-5 CAS# 1310-58-3	Not present on state lists from CA, PA, MN, MA, or NJ. Can be found on the following state right to know lists; CA, NJ, PA, MN, MA.
California Prop 65		California No Significant Risk Level: None of the chemicals are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Classification	Corrosive	
Hazard Symbol	C	
EC Number	215-181-3	
Risk Phrases	R35 R22	Causes severe burns. Harmful if swallowed
Safety Phrases	S1/2 S26 S36 S37/39 S45	Keep locked up and out of reach of children. In case of contact with the eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing. Wear suitable gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show label where possible).
WGK (Water Danger/Protection)	CAS# 7732-18-5	No information available
Canada – DSL/ NDSL	CAS# 1310-58-3 CAS# 7732-18-5 CAS# 1310-58-3	1 Listed on Canada’s DSL List Listed on Canada’s DSL List
Canada - WHMIS	Classification E, D1B	Classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient	CAS# 1310-58-3	Listed on the Canadian Ingredient Disclosure List

Disclosure List

16. Other Information

MSDS Creation Date: 09/30/94

MSDS Revised: May 1, 2007

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information. Liability is expressly disclaimed for loss or injury arising out of use of this information or the use of any materials designated. Users should make their own investigation to determine the suitability of the information for their particular purpose.

MSDS Review Date: June 8, 2009