MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**PERCHLORIC ACID SOLUTION, 0.1 N, AQUEOUS**
Catalog #	1677
Version #	02
Revision date	15-Jul-2008
CAS #	Mixture
Manufacturer information	GFS Chemicals, Inc. P.O. Box 245 Powell, OH 43065 US www.gfschemicals.com Fax 740-881-5989 Phone 740-881-5501 Toll Free 800-858-9682 Emergency Assistance Chemtrec 800-424-8300

2. Hazards Identification

Emergency overview	DANGER Corrosive. Contact with skin may cause irritation. Contact with eyes may cause irritation.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	Contact may irritate or burn eyes. Do not get this material in contact with eyes.
Skin	Contact may irritate or burn skin.
Inhalation	Do not breathe dust/fume/gas/mist/vapors/spray.
Ingestion	Ingestion may cause irritation to mucous membranes.
Target organs	Thyroid.
Signs and symptoms	Eye irritation Skin irritation.

3. Composition / Information on Ingredients

Non-hazardous components	CAS #	Percent
WATER	7732-18-5	90 - 100
PERCHLORIC ACID	7601-90-3	0.1 - 1

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Skin contact	Immediately flush skin with plenty of water. Remove and isolate contaminated clothing and shoes. Get medical attention immediately. For minor skin contact, avoid spreading material on unaffected skin. Wash clothing separately before reuse.
Inhalation	Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately.
Ingestion	If material is ingested, immediately contact a poison control center. Have victim rinse mouth thoroughly with water. Do not induce vomiting without advice from poison control center. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Notes to physician	In case of shortness of breath, give oxygen. Keep victim warm.
General advice	Immediate medical attention is required. In case of shortness of breath, give oxygen. Keep victim warm. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties	The product is not flammable. Contact with combustible material may cause fire.
Extinguishing media	
Suitable extinguishing media	Water. Water spray.
Protection of firefighters	
Specific hazards arising from the chemical	Fire may produce irritating, corrosive and/or toxic gases.
Protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

6. Accidental Release Measures

Personal precautions	Local authorities should be advised if significant spillages cannot be contained. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering. Keep unnecessary personnel away. Stay upwind. Keep out of low areas.
Environmental precautions	Prevent further leakage or spillage if safe to do so.
Methods for containment	Stop leak if you can do so without risk. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Prevent entry into waterways, sewers, basements or confined areas.
Methods for cleaning up	Dilute with water. Neutralize with sodium hydroxide, soda ash or lime. After removal flush contaminated area thoroughly with water.
Other information	Clean up in accordance with all applicable regulations.

7. Handling and Storage

Handling	Do not get this material in contact with eyes. Do not get this material in contact with skin. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get this material on clothing. Use only with adequate ventilation. Wash thoroughly after handling. Handle and open container with care. Take off contaminated clothing and wash before re-use.
Storage	Keep in a well-ventilated place. Keep container tightly closed. Do not store around flammable or combustible materials. Keep out of the reach of children. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Engineering controls	Ensure adequate ventilation, especially in confined areas. General ventilation normally adequate.
Personal protective equipment	
Respiratory protection	Do not breathe dust/fume/gas/mist/vapors/spray. In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit.
Hand protection	Protective gloves.
Eye / face protection	Do not get this material in contact with eyes. Wear chemical goggles. Face-shield.
Skin protection	Do not get this material in contact with skin. Do not get this material on clothing. Wear appropriate chemical resistant gloves. Structural firefighters protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations. Use chemical splash goggles and face shield (ANSI Z87.1 or approved equivalent). Wear chemical protective equipment that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
General hygeine considerations	Do not get this material in contact with eyes. Do not get this material in contact with skin. Do not get this material on clothing. When using, do not eat, drink or smoke. Keep away from food and drink. Handle in accordance with good industrial hygiene and safety practice.
General	Structural firefighters protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations.

9. Physical & Chemical Properties

Appearance	Clear.
Color	Colorless.
Odor	Odorless.
Odor threshold	Not available.
Physical state	Liquid.
Form	Liquid.
pH	< 1
Melting point	Not available.
Freezing point	Not available.
Boiling point	> 212 °F (> 100 °C)
Flash point	Not flammable
Evaporation rate	Not available.
Flammability	Not available.
Flammability limits in air, upper, % by volume	Not flammable
Flammability limits in air, lower, % by volume	Not flammable
Vapor pressure	Not available.
Vapor density	Not available.
Specific gravity	1.01
Relative density	1.01 g/cm3
Solubility (water)	Completely miscible
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Molecular weight	100.4600
Molecular formula	$HClO_4$

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions. Becomes oxidizing at elevated temperatures (>150 C).
Conditions to avoid	Avoid temperatures above 300°F (150°C). Drying of this product on clothing or combustible materials may cause fire.
Incompatible materials	Flammable materials and Combustible material.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicology data for the preparation

Acute LD50: 1100 mg/kg, Rat, Oral

Local effects	Irritating to respiratory system.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Corrosivity	Hazardous by OSHA criteria.
Human experience	The perchlorate ion competes with iodide in the mechanism that governs uptake into the thyroid gland for growth hormone production. This effect is routinely countered by ensuring sufficient dietary intake of iodine, as perchlorate does not accumulate in the body. Studies on workers in plants where perchlorates are manufactured have shown no thyroid abnormalities; various clinical studies are ongoing. Perchlorates occur naturally in trace amounts in the environment, and are not classified as carcinogenic.

12. Ecological Information

Ecotoxicity	This product has no known eco-toxicological effects. This material is not expected to be harmful to aquatic life.

Persistence and degradability Not available.

13. Disposal Considerations

Disposal instructions Solutions with low pH-value must be neutralized before discharge. Dispose in accordance with all applicable regulations.

Waste from residues / unused products Not applicable.

14. Transport Information

DOT

Basic shipping requirements:

Proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s.
Hazard class	8
UN number	UN3264
Packing group	III
Additional information:	
Special provisions	IB3, T7, TP1, TP28
Packaging exceptions	154
Packaging non bulk	203
Packaging bulk	241
ERG number	154

15. Regulatory Information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance	No
Section 311 hazardous chemical	Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - Pennsylvania RTK - Hazardous Substances: Listed substance

PERCHLORIC ACID	7601-90-3	Listed.

16. Other Information

HMIS® ratings
Health: 3
Flammability: 0
Physical hazard: 1

NFPA ratings
Health: 3
Flammability: 0
Instability: 1

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This data sheet contains changes from the previous version in section(s): This document has undergone significant changes and should be reviewed in its entirety.