SAFETY DATA SHEET

Preparation Date: 05/08/2015 **Revision Date:** 05/08/2015 **Revision Number:** G1

1. IDENTIFICATION

Product identifier

Product code: P1030
Product Name: PERCHLORIC ACID, 60 PERCENT, REAGENT, ACS

Other means of identification

Synonyms:
Perchloric Acid, >50% but not >72% acid, by mass
Perchloric Acid, >72% acid by mass
Perchloric Acid, not >50% acid, by mass
Hydronium Perchlorate
Acide perchlorique, contenant plus de 50% mais au maximum 72% d'acide (French DOT)
Dioxonium perchlorate solution
Perchloric acid solution
UN1873
UN1802 (with not more than 50% acid)

CAS #: 7601-90-3
RTECS # SC7500000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: Catalyst. Oxidizer and for separation of potassium; explosives and for plating of metals/perchlorate salts; tiration reagent in determination of 1H-Benzotriazole in air; ingredient of electrolytic bath in deposition of lead.
Uses advised against No information available

Supplier:
Spectrum Chemical Mfg. Corp
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000
Order Online At: https://www.spectrumchemical.com

Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 1Sub-category A

Serious eye damage/eye irritation	Category 1
Oxidizing liquids	Category 1
Corrosive to metals	Category 1

Label elements

Danger

Hazard statements
Harmful if swallowed
Causes severe skin burns and eye damage
May cause fire or explosion; strong oxidizer
May be corrosive to metals

Hazards not otherwise classified (HNOC)
Not Applicable

Other hazards
Not available

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray
Wear protective gloves/protective clothing/eye protection/face protection
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Keep/Store away from clothing/ .? /combustible materials
Take any precaution to avoid mixing with combustibles .?
Wear fire/flame resistant/retardant clothing
Keep only in original container

Precautionary Statements - Response
Immediately call a POISON CENTER or doctor/physician
Specific treatment (see .? on this label)
IN CASE OF FIRE: Flood with water to extinguish. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
Absorb spillage to prevent material damage
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor/physician.

Wash contaminated clothing before reuse
IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth
Do NOT induce vomiting

Precautionary Statements - Storage
Store locked up
Store in corrosive resistant/ .? container with a resistant inner liner

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %	Trade Secret
Perchloric acid 7601-90-3	7601-90-3	60-62	*
Water 7732-18-5	7732-18-5	38-40	*

4. FIRST AID MEASURES

First aid measures

General Advice: Poison information centers in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact: Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove and wash contaminated clothing before re-use. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Eye Contact: Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms Contact causes severe skin irritation and possible burns. Inflammation of the eye is characterized by redness, watering and itching. Skin contact may result in redness, pain, inflammation, itching, scaling. Harmful if swallowed.

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically

Protection of first-aiders
First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

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Suitable Extinguishing Media: Water. CO2 may be of no value in extinguishing fires involving oxidizers and may only provide limited control.

Unsuitable Extinguishing Media: Dry chemical. Foam. Halons.

Specific hazards arising from the chemical

Hazardous Combustion Products: Hydrogen chloride

Specific hazards: Oxidizer. Keep away from combustible materials (wood, paper, oil, clothing, etc.)
The product is not flammable, but it may cause fire when in contact with other material
May ignite combustibles (wood, paper, oil, clothing, etc.)
Contact with combustible or organic materials may cause fire
Will accelerate burning when involved in a fire
Container explosion may occur under fire conditions or when heated

Special Protective Actions for Firefighters

Specific Methods: For large fires, flood fire area with water from a distance. Cool affected containers with flooding quantities of water. Do not get water inside containers. DO NOT use combustible materials such as sawdust.

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Keep combustibles (wood, paper, oil, clothing, etc.) away from spilled material. Remove all sources of ignition.

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite). In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Do not use combustible materials such as paper towels, sawdust, clothing, etc. to clean up spill. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

7. HANDLING AND STORAGE

Technical Measures/Precautions:
Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. Keep away from incompatible materials.

Safe Handling Advice
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Use only in well-ventilated areas. Do not breathe vapours/dust. When using do not smoke. Do not ingest. Keep away from combustible material. Keep away from heat and sources of ignition. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:
Hygroscopic. Protect from moisture. Keep container tightly closed in a dry and well-ventilated place. Do not store near combustible materials. Store away from incompatible materials. Store in a segrated and approved area.

Incompatible Materials:
Incompatible with acids, acetic anhydride, alcohols, aniline and formaldehyde, alkaline materials, organic materials, combustible materials (cellulose, paper, wood), Antimony III compounds, bismuth, charcoal, dibutyl sulfoxide, diethyl ether, dimethyl sulfoxide, fluorine, glycerine and lead oxide, glycol ethers, hydriodic acid, hydrogen, hypophosphites, ketones, methyl alcohol, nitrogen iodide, nitrosophenol, phosphorous pentoxide, phosphorus pentoxide and chloroform, sodium iodide, steel, sulfoxides, sulfur trioxide.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Perchloric acid 7601-90-3	None	None	None	None
Water 7732-18-5	None	None	None	None

Canada

Components	Alberta	British Columbia	Ontario	Quebec
Perchloric acid 7601-90-3	None	None	None	None
Water 7732-18-5	None	None	None	None

Australia and Mexico

Components	Australia	Mexico
Perchloric acid 7601-90-3	None	None
Water 7732-18-5	None	None

Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Face-shield Goggles

Skin and body protection: Chemical resistant protective suit. Gloves. Boots.

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures: Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:
Liquid

Appearance:
Oily.

Color:
Clear. Colorless.

Odor:
Odorless.

Taste
No information available

Molecular/Formula weight:
100.46 g/mol

Formula:
HClO4

Flammability:
No information available

Flash point (°C):
No data available

Flashpoint (°C/°F):
No information available.

Flash Point Tested according to:
Not available

Autoignition Temperature (°C/°F):
No information available

Lower Explosion Limit (%):
No information available

Upper Explosion Limit (%):
No information available

pH:
No information available

Melting point/range(°C/°F):
-18-(-19)/ 0-(-2.2)°F

Boiling point/range(°C/°F):
203°C/ 397°F

Bulk density:
No information available

Decomposition temperature(°C/°F):
No information available

Density (g/cm3):
No information available

Specific gravity:
1.67

Vapor pressure @ 20°C (kPa):
0.9

Evaporation rate:
No information available

Vapor density:
3.46

VOC content (g/L):
No information available

Odor threshold (ppm):
No information available

Partition coefficient (n-octanol/water):
No information available

Viscosity:
No information available

Miscibility:
Miscible with water

Solubility:
Easily soluble in cold water

10. STABILITY AND REACTIVITY

Reactivity

Reactive with acids, acetic anhydride, alcohols, aniline and formaldehyde, alkaline materials, organic materials, combustible materials (cellulose, paper, wood), Antimony III compounds, bismuth, charcoal, dibutyl sulfoxide, diethyl ether, dimethyl sulfoxide, fluorine, glycerine and lead oxide, glycol ethers, hydriodic acid, hydrogen, hypophosphites, ketones, methyl alcohol, nitrogen iodide, nitrosophenol, phosphorous pentoxide, phosphorus pentoxide and chloroform, sodium iodide, steel, sulfoxides, sulfur trioxide. May react violently or explosively with many of these compounds. Reaction with fuels may be violent. Mixtures of acetic acid, perchloric, and acetic anhydride have varying degrees of sensitivity to shock. Addition of acetic anhydride to aqueous solution of perchloric acid causes formation of acetic acid which can react violently with perchloric acid.

Chemical stability

Stability: Hygroscopic. Perchloric acid itself is unstable (volatile) in concentrated form. It may undergo spontaneous and explosive decomposition. Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Ignition sources. Incompatible materials. Contact with combustible materials (wood, paper, oil, clothing, etc.). Exposure to moisture. Exposure to moist air.

Incompatible Materials: Incompatible with acids, acetic anhydride, alcohols, aniline and formaldehyde, alkaline materials, organic materials, combustible materials (cellulose, paper, wood), Antimony III compounds, bismuth, charcoal, dibutyl sulfoxide, diethyl ether, dimethyl sulfoxide, fluorine, glycerine and lead oxide, glycol ethers, hydriodic acid, hydrogen, hypophosphites, ketones, methyl alcohol, nitrogen iodide, nitrosophenol, phosphorous pentoxide, phosphorus pentoxide and chloroform, sodium iodide, steel, sulfoxides, sulfur trioxide.

Hazardous decomposition products: No information available.

Other Information

Corrosivity: Extremely corrosive in presence of aluminum, of copper
Highly corrosive in the presence of stainless steel (304)
Non-corrosive in the presence of glass

Special Remarks on Corrosivity: Minor corrosive effect on bronze

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Skin. Eyes. Inhalation. Ingestion.

Acute Toxicity

Component Information

Perchloric acid - 7601-90-3

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rat = No information available
LD50/dermal/rabbit = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No infomation available
Other LD50 or LC50information = No information available

Water - 7732-18-5

LD50/oral/rat = > 90 mL/kg Oral LD50 Rat
LD50/oral/mouse = No information available
LD50/dermal/rat = No information available
LD50/dermal/rabbit = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No infomation available
Other LD50 or LC50information = No information available

Product Information

LD50/oral/rat =
VALUE- Acute Tox Oral = 1150mg/kg

LD50/oral/mouse =
Value - Acute Tox Oral = No information available

LD50/dermal/rabbit
VALUE-Acute Tox Dermal = No information available

LD50/dermal/rat
VALUE -Acute Tox Dermal = No information available

LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
VALUE-Vapor = No information available
VALUE - Gas = No information available

VALUE - Dust/Mist = No information available
Symptoms

Skin Contact:	Causes skin burns. May cause deep penetrating ulcers of the skin.
Eye Contact:	Causes eye burns. May cause retinal damage.
Inhalation	May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. Inhalation may fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema..
Ingestion	Harmful if swallowed. Causes intestinal tract burns (corrosion or burns of the mouth, throat, esophagus). Symptoms may include pain, dysphagia, necrotic areas, epigastric pain, which may be associated with nausea, and vomiting, corrosive ulceration, gastric bleeding, profound thirst, scanty urine, shock and circulatory collapse. May also affect behavior, respiration(dyspnea), and metabolism, liver, kidneys, and cardiovascular system..
Aspiration hazard	No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity	Skin: Repeated or prolonged skin contact may cause skin sensitization, an allergic reaction and possible destruction and/or ulceration. Inhalation: Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis. Eyes: Prolonged or repeated eye contact may cause conjunctivitis. Ingestion: Chronic ingestion may cause effects similar to those of acute ingestion.
Sensitization:	No information available
Mutagenic Effects:	No information available
Carcinogenic effects:	Not considered carcinogenic

Components	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
Perchloric acid	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed
Water	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

Reproductive toxicity No data is available

Reproductive Effects: No information available
Developmental Effects: No information available
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available
STOT - repeated exposure No information available
Target Organs: Lungs.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available

Mobility: No information available

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

Components	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Perchloric acid	None	None	None	None
Water	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No: UN1873
Proper Shipping Name: Perchloric acid
Hazard Class: 5.1
Subsidiary Risk: 8

14. TRANSPORT INFORMATION

Packing Group: I
ERG No: 143
Marine Pollutant No data available
DOT RQ (lbs): No information available
Symbol(s):

TDG (Canada)

UN-No: UN1873
Proper Shipping Name: Perchloric acid
Hazard Class: 5.1
Subsidiary Risk: (8)
Packing Group: I
Description: No information available

ADR

UN-No: UN1873
Proper Shipping Name: Perchloric acid
Hazard Class: 5.1
Packing Group: I
Subsidiary Risk: 8
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG

UN-No: UN1873
Proper Shipping Name: Perchloric acid
Hazard Class: 5.1
Subsidiary Risk: 8
Packing Group: I
Description: No information available
IMDG Page: No information available
Marine Pollutant No information available
EMS: F-A
MFAG: No information available
Maximum Quantity: No information available

RID

UN-No: UN1873
Proper Shipping Name: Perchloric acid
Hazard Class: 5.1
Subsidiary Risk: 8
Packing Group: I
Classification Code: No information available
Description: No information available

ICAO

UN-No: UN1873
Proper Shipping Name: Perchloric acid
Hazard Class: 5.1
Subsidiary Risk: 8
Packing Group: I
Description: No information available

IATA

UN-No: UN1873

14. TRANSPORT INFORMATION

Proper Shipping Name: Perchloric acid
Hazard Class: 5.1
Subsidiary Risk: 8
Packing Group: I
ERG Code: 5C
Description: No information available

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Perchloric acid	Present	Present KE-28137	Present	Present (1)-221	Present	Present	Present 231-512-4
Water	Present	Present KE-35400	Present	Not present	Present	Present	Present 231-791-2

U.S. Regulations

Perchloric acid

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 2637
Pennsylvania RTK: Present
Michigan PSM HHC: = 5000 lb TQ concentration greater than 60% by weight

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Perchloric acid	Not Listed	Not Listed	Not Listed	Not Listed
Water	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting *de minimis*
Perchloric acid	None	None	None	None	None
Water	None	None	None	None	None

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Perchloric acid	Not Applicable	Not Applicable
Water	Not Applicable	Not Applicable

Canada

WHMIS hazard class:
C Oxidizing materials
E Corrosive material

Perchloric acid

C E F
E 1.0%
C E 60%, 70-72%

Water

Uncontrolled product according to WHMIS classification criteria

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Components	WHMIS Ingredient Disclosure List -
Perchloric acid	1 %

Inventory

Components	Canada (DSL)	Canada (NDSL)
Perchloric acid	Present	Not Listed
Water	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Manditory Reporting
Perchloric acid	Not listed	Not listed
Water	Not listed	Not listed

EU Classification

R-phrase(s)

R35 - Causes severe burns.
R 5 - Heating may cause an explosion.
R 8 - Contact with combustible material may cause fire.

S -phrase(s)

S23 - Do not breathe gas/fumes/vapor/spray.
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36 - Wear suitable protective clothing.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 1/2 - Keep locked up and out of the reach of children.

Components	Classification	Concentration Limits:	Safety Phrases
Perchloric acid	C; R35 R5 O; R8	1%<=C<10% Xi;R36/38 10%<=C<50% C;R34 50%<=C C;R35	S1/2 S23 S26 S36 S45
Water		No information	

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
C - Corrosive.
O - Oxidising.

16. OTHER INFORMATION

Preparation Date: 05/08/2015
Revision Date: 05/08/2015
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet