

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product Identifier

Product Description: Barium perchlorate trihydrate
Cat No. : 11656
CAS No 10294-39-0
Molecular Formula Ba(Cl O4)2.3H2 O

Relevant identified uses of the substance or mixture and uses advised against

Recommended Use Laboratory chemicals.
Uses advised against No Information available

Details of the supplier of the safety data sheet
Importer

Fisher Scientific Korea
 D5,D6, Incheon Airport Logistics Complex
 150, Gonghangdong-Ro Mapo-Gu 296 Beon-Gil
 Jung-Gu, Incheon 400-340
 Tel: +82-2-6196-5500
 Fax: +82-2-6196-5501

Supplier

Alfa Aesar
 Thermo Fisher Scientific Chemicals, Inc.
 30 Bond Street
 Ward Hill, MA 01835-8099

E-mail address Chem.KR@thermofisher.com

Emergency Telephone Number

Emergency telephone: Medical: +(82) 070-7686-0086 or + 1-703-741-5970
 CHEMTREC: 1-800-424-9300 or + 1-703-527-3887
 Korea: 00-308-13-2549 (24 hours a day, 7 days a week)

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture
Physical hazards

Oxidizing solids Category 1

Health hazards

Acute Oral Toxicity Category 4
 Acute Inhalation Toxicity - Dusts and Mists Category 4

Environmental hazards

Based on available data, the classification criteria are not met

Label Elements

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022



Signal Word

Danger

Hazard Statements

H271 - May cause fire or explosion; strong oxidizer

H302 + H332 - Harmful if swallowed or if inhaled

Precautionary Statements

Prevention

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

P220 - Keep away from clothing and other combustible materials

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P283 - Wear fire resistant or flame retardant clothing

P264 - Wash hands and face thoroughly after handling

P270 - Do not eat, drink or smoke when using this product

P261 - Avoid breathing dust/fume/gas/mist/vapors/spray

P271 - Use only outdoors or in a well-ventilated area

Response

P306 + P360 - IF ON CLOTHING: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes

P371 + P380 + P375 - In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion

P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction

P330 - Rinse mouth

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing

P301 + P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell

P312 - Call a POISON CENTER or doctor if you feel unwell

Storage

P420 - Store separately

Disposal

P501 - Dispose of contents/ container to an approved waste disposal plant

Other Hazards

NFPA

Health
2

Flammability
0

Instability
1

Physical hazards
- OX

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Component	Common Name	CAS No	Index No	Weight %
Perchloric acid, barium salt, trihydrate	No information available	10294-39-0	Not listed	99 - 100

Note Note 1: The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation (Table 3.1) or the generic concentrations of Directive 1999/45/EC (Table 3.2), are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture

SECTION 4: FIRST AID MEASURES

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

Description of first aid measures

General Advice

If symptoms persist, call a physician.

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact

Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Ingestion

Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.

Inhalation

Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Self-Protection of the First Aider

Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

Most important symptoms and effects, both acute and delayed

None reasonably foreseeable.

Indication of any immediate medical attention and special treatment needed

Notes to Physician

Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media

Not combustible.

Extinguishing media which must not be used for safety reasons

No information available.

Special hazards arising from the substance or mixture

Oxidizer: Contact with combustible/organic material may cause fire. May ignite combustibles (wood, paper, oil, clothing, etc.).

Hazardous Combustion Products

Hydrogen chloride, Barium oxides.

Advice for fire-fighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Ensure adequate ventilation. Use personal protective equipment as required. Avoid dust formation.

Environmental precautions

Should not be released into the environment. See Section 12 for additional Ecological Information.

Methods and Material for Containment and Cleaning Up

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

Sweep up and shovel into suitable containers for disposal. Keep in suitable, closed containers for disposal. Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal.

Reference to Other Sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

Precautions for Safe Handling

Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Avoid dust formation. Keep away from clothing and other combustible materials.

Conditions for Safe Storage, Including any Incompatibilities

Store under an inert atmosphere. Protect from moisture. Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store near combustible materials.

Specific End Uses

Use in laboratories.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Component	CAS No	Korea	ACGIH TLV	OSHA PEL
Perchloric acid, barium salt, trihydrate	10294-39-0	TWA: 0.5 mg/m ³	TWA: 0.5 mg/m ³	(Vacated) TWA: 0.5 mg/m ³

Component	CAS No	European Union	The United Kingdom	Germany
Perchloric acid, barium salt, trihydrate	10294-39-0	TWA: 0.5 mg/m ³ (8hr)	STEL: 1.5 mg/m ³ 15 min TWA: 0.5 mg/m ³ 8 hr	TWA: 0.5 mg/m ³ (8 Stunden). AGW - exposure factor 1 TWA: 0.5 mg/m ³ (8 Stunden). MAK Höhepunkt: 4 mg/m ³

Biological Exposure Indices

Component	CAS No	Biological Exposure Indices
Perchloric acid, barium salt, trihydrate	10294-39-0	Not listed

Exposure Controls

Engineering Measures

Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection

Wear safety glasses with side shields (or goggles)

Hand Protection

Protective gloves

Skin and body protection

Long sleeved clothing

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Personal protective equipment Use only those certified by the Korea Occupational Safety and Health Administration.
Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators
Recommended Filter type: Particulates filter conforming to EN 143
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly
When RPE is used a face piece Fit Test should be conducted

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice

Environmental exposure controls No information available

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance (Physical State, Color, etc.) White Solid Crystalline

Odor Odorless
Odor Threshold No data available
pH No information available

Melting Point/Range No data available
Softening Point No data available
Boiling Point/Range No information available
Flash Point No information available **Method -** No information available

Evaporation Rate Not applicable Solid
Flammability (solid,gas) No information available
Explosion Limits No data available

Vapor Pressure No data available
Vapor Density Not applicable Solid
Specific Gravity / Density 2.74 g/cm3 @ 20 °C
Bulk Density No data available
Water Solubility No information available
Solubility in other solvents No information available

Partition Coefficient (n-octanol/water)

Component	CAS No	log Pow
Perchloric acid, barium salt, trihydrate	10294-39-0	No data available

Autoignition Temperature No data available
Decomposition Temperature No data available
Viscosity Not applicable Solid
Explosive Properties No information available
Oxidizing Properties Oxidizer

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

Molecular Formula Ba(Cl O₄)₂·3H₂O
Molecular Weight 390.29 (336.24anhy)

SECTION 10: STABILITY AND REACTIVITY

Reactivity Yes

Chemical Stability Hygroscopic. Oxidizer: Contact with combustible/organic material may cause fire.

Possibility of Hazardous Reactions

Hazardous Polymerization No information available.
Hazardous Reactions None under normal processing.

Conditions to Avoid Exposure to moist air or water. Incompatible products. Excess heat. Combustible material.

Incompatible Materials Strong reducing agents. Combustible material.

Hazardous Decomposition Products Hydrogen chloride. Barium oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Product Information

Information on expected route of exposure

Inhalation Not an expected route of exposure.
Ingestion May be harmful if swallowed.
Eyes Avoid contact with eyes.
Skin Avoid contact with skin.

Information on Health Hazards

(a) acute toxicity; .
Oral Category 4
Dermal No data available
Inhalation Category 4

Component	CAS No	LD50 Oral	LD50 Dermal	LC50 Inhalation
Perchloric acid, barium salt, trihydrate	10294-39-0	No data available	No data available	No data available

(b) skin corrosion/irritation; No data available

(c) serious eye damage/irritation; No data available

(d) respiratory or skin sensitization;

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

Respiratory No data available
Skin No data available

Component	CAS No	Test method	Test species	Study result
Perchloric acid, barium salt, trihydrate	10294-39-0	No data available	No data available	No data available

(e) germ cell mutagenicity; No data available

Component	CAS No	Test method	Test species	Study result
Perchloric acid, barium salt, trihydrate	10294-39-0	No data available	No data available	No data available

(f) carcinogenicity; No data available

Component	CAS No	Test method	Test species / Duration	Study result
Perchloric acid, barium salt, trihydrate	10294-39-0	No data available	No data available	No data available

There are no known carcinogenic chemicals in this product

Component	CAS No	IARC	NTP	ACGIH	OSHA	UK
Perchloric acid, barium salt, trihydrate	10294-39-0	Not listed	Not listed	Not listed	Not listed	Not listed

(g) reproductive toxicity; No data available

Component	CAS No	Test method	Test species / Duration	Study result
Perchloric acid, barium salt, trihydrate	10294-39-0	No data available	No data available	No data available

(h) STOT-single exposure; No data available

(i) STOT-repeated exposure; No data available

Target Organs No information available.

(j) aspiration hazard; Not applicable
Solid

Other Adverse Effects
No information available.

Component	CAS No	EU - Endocrine Disruptors Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	Not applicable

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity effects Contains no substances known to be hazardous to the environment or that are not degradable in waste water treatment plants.

Component	CAS No	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Perchloric acid, barium salt, trihydrate	10294-39-0	No data available	No data available	No data available	No data available

Persistence and degradability No information available

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

Bioaccumulative potential No information available

Mobility in soil No information available

Ozone Depletion Potential

Component	CAS No	Ozone Depletion Potential
Perchloric acid, barium salt, trihydrate	10294-39-0	Not listed

Other adverse effects No information available

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from Residues/Unused Products Waste is classified as hazardous. Dispose in accordance with the Wastes Control Act (폐기물관리법).

Contaminated Packaging Dispose of this container to hazardous or special waste collection point.

Other Information Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains.

SECTION 14: TRANSPORT INFORMATION

Road and Rail Transport

UN-No UN1447
Proper Shipping Name BARIUM PERCHLORATE, SOLID
Hazard Class 5.1
Subsidiary Hazard Class 6.1
Packing Group II

IATA

UN-No UN1447
Proper Shipping Name BARIUM PERCHLORATE, SOLID
Hazard Class 5.1
Subsidiary Hazard Class 6.1
Packing Group II

IMDG/IMO

UN-No UN1447
Proper Shipping Name BARIUM PERCHLORATE, SOLID
Hazard Class 5.1
Subsidiary Hazard Class 6.1
Packing Group II
Marine Pollutant No hazards identified

Special Precautions for User No special precautions required

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Legend: X - Listed '-' - Not Listed

International Inventories

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

Component	CAS No	KECL	TSCA	EINECS	IECSC	DSL	NDSL	PICCS	ENCS	ISHL	AICS
Perchloric acid, barium salt, trihydrate	10294-39-0	-	-	-	-	-	-	X	-		X

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements	Rotterdam Convention (PIC)	Basel Convention (Hazardous Waste)
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	Not applicable	Not applicable

Component	CAS No	OECD HPV	Persistent Organic Pollutant	Ozone Depletion Potential
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	Not applicable

Korean National Regulations

Component	CAS No	Act on Registration and Evaluation of Chemical Substances (K-REACH)	Authorised Chemicals	Existing Substances Subject to Registration
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	Not applicable

Component	CAS No	Chemical Control Act - Toxic Chemicals	Chemical Control Act - Prohibited Chemicals	Chemical Control Act - Use Restricted Chemicals
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	Not applicable

Component	CAS No	Chemical Control Act - Accident Precaution Chemicals (% in mixtures)	Chemical Control Act - Accident Precaution Chemicals - Quantity limits Storage (% in mixtures)	Chemical Control Act - Accident Precaution Chemicals - Quantity limits Manufacture/Use (% in mixtures)
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	Not applicable

Component	CAS No	Waste Control Law	Ministry of Environment - CMR risk	Ministry of Environment - Critically Controlled Substance
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	Not applicable

Component	CAS No	ISHA - Harmful Agents Subject to Work Environment Monitoring	ISHA - Prohibited substances	ISHA - Substances requiring permission
Perchloric acid, barium salt, trihydrate	10294-39-0	Listed	Not applicable	Not applicable

Component	CAS No	ISHA - Substances subject to control	ISHA - Harmful Agents Requiring Health Examination	ISHA - Permissible Exposure Limits
Perchloric acid, barium salt, trihydrate	10294-39-0	Listed	Not applicable	Not applicable

Component	CAS No	ISHA - Subject to Process Safety Reports (minimum quantity)	ISHA - Threshold Limit Values (TLVs) Chemicals	ISHA - Special management materials
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	TWA: 0.5 mg/m ³	Not applicable

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

National Fire Association - Dangerous Substances Minimum quantity requiring a permit

Component	CAS No	Class 1 - Oxidising solids	Class 2 - Flammable solid	Class 3 - Spontaneously Combustible Substances and Dangerous Substances When Wet	Class 4 - Flammable liquids	Class 5 - Self-reactive substances	Class 6 - Oxidising liquids
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

NFA Dangerous Substances Classification

Class 1.3 (Perchlorates) - 50 kg

Control Parameters

Component	CAS No	Korea	Biological Exposure Indices
Perchloric acid, barium salt, trihydrate	10294-39-0	TWA: 0.5 mg/m ³	Not listed

US Management Information

OSHA - Occupational Safety and Health Administration

Not applicable

Component	CAS No	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable

CERCLA

Not applicable

Component	CAS No	CERCLA EHS RQs	Hazardous Substances RQs	SARA 313 - Threshold Values %
Perchloric acid, barium salt, trihydrate	10294-39-0	Not applicable	Not applicable	1.0

CLP Classification - Regulation (EC) No 1272/2008

Danger.

H271 - May cause fire or explosion; strong oxidizer. H302 + H332 - Harmful if swallowed or if inhaled.

P221 - Take any precaution to avoid mixing with combustibles. P371 + P380 + P375 - In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. P280 - Wear protective gloves/protective clothing/eye protection/face protection. P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting. P312 - Call a POISON CENTER or doctor if you feel unwell. P264 - Wash face, hands and any exposed skin thoroughly after handling. P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

SECTION 16: OTHER INFORMATION

Legend

CAS - Chemical Abstracts Service

EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

IECSC - Chinese Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

ENCS - Japanese Existing and New Chemical Substances

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

SAFETY DATA SHEET

Barium perchlorate trihydrate

Revision Date 14-Apr-2022

WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
POW - Partition coefficient Octanol:Water

TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMO/MDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
MARPOL - International Convention for the Prevention of Pollution from Ships
ATE - Acute Toxicity Estimate
VOC (volatile organic compound)

Key literature references and sources for data

<https://echa.europa.eu/information-on-chemicals>
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Prepared By	Health, Safety and Environmental Department
Creation Date	15-Apr-2015
Revision Date	14-Apr-2022
Revision Number	4
Revision Summary	SDS sections updated.

MOEL's Public Notice No. 2020-130 (Standards for Classification and Labeling of Chemical Substances and Safety Data Sheets)

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet