

Zirconium, standard solution 1000mg/L,
JUNSEI CHEMICAL CO., LTD.,37692jis_J_E2-2,07/Nov/2023

Date of issue for the 1st edition : 09/Apr/2021

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Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Zirconium, standard solution 1000mg/L

Reference number(SDS):37692jis_J_E2-2

Product type:

Reagent

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

Relevant identified uses of the product: Atomic absorption spectrometry

Uses advised against: Do not use for other purposes.

Details of the supplier of the safety data sheet

Manufacturer/Supplier: JUNSEI CHEMICAL CO., LTD.

Address: 1-6, Ohmano-cho, Koshigaya-shi, Saitama 343-0844, Japan

Division: Quality Assurance Department

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Section 2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

HEALTH HAZARDS

Acute toxicity (Inhalation): Category 4

Skin corrosion/irritation: Category 1B

Serious eye damage/eye irritation: Category 1

Specific target organ toxicity – single exposure: Category 2 (respiratory organs)

Specific target organ toxicity – repeated exposure: Category 2 (respiratory organs)

ENVIRONMENT HAZARDS

Hazardous to the aquatic environment, long-term (chronic): Category 2

(Note) GHS classification without description: Not classified/Classification not possible

Label elements



Signal word: Danger

HAZARD STATEMENT

H332-Harmful if inhaled

H314-Causes severe skin burns and eye damage

H318-Causes serious eye damage

H371-May cause damage to organs

H373-May cause damage to organs through prolonged or repeated exposure

H411-Toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENT

Prevention

Avoid release to the environment.

Do not breathe dust/fume/gas/mist/vapors/spray.

Use only outdoors or in a well-ventilated area.

Wash contaminated parts thoroughly after handling.

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Wear protective gloves, protective clothing or face protection.

Wear eye protection/face protection.

Do not eat, drink or smoke when using this product.

Response

Collect spillage.

Get medical advice/attention if you feel unwell.

Immediately call a POISON CENTER/doctor/physician.

Call a POISON CENTER/doctor/physician if you feel unwell.

IF exposed or concerned: Call a POISON CENTER/doctor/physician.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

Wash contaminated clothing before reuse.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Storage

Store locked up.

Disposal

Dispose of contents/container in accordance with local/national regulation.

Section 3. Composition/information on ingredients

Mixture/Substance selection:

Mixture

Ingredient name:Zirconium (IV) sulfate

Content (%):0.31

Chemical formula:O8S2Zr

Chemicals No, Japan:1-725

CAS No.:14644-61-2

MW:283.44

ECNO:238-694-4

Ingredient name:Sulfuric acid

Content (%):1 ~ 5

Chemical formula:H2O4S

Chemicals No, Japan:1-430

CAS No.:7664-93-9

MW:98.08

ECNO:231-639-5

Ingredient name:Hydrofluoric acid

Content (%):< 0.1

Chemical formula:FH

Chemicals No, Japan:1-306

CAS No.:7664-39-3

MW:20.01

ECNO:231-634-8

Ingredient name:Water

Content (%):Residual quantity of the ingredient mentioned above.

Chemical formula:H2O

CAS No.:7732-18-5

MW:18.02

ECNO:231-791-2

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Note : The figures shown above are not the specifications of the product.

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical advice/attention if you feel unwell.
Immediately call a POISON CENTER/doctor/physician.
Keep victim warm and quiet.
Call emergency medical service.
Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.
Give artificial respiration if victim is not breathing.
Administer oxygen if breathing is difficult.
Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN (or hair)

Take off immediately all contaminated clothing. Rinse skin with water or shower.
If skin irritation or rash occurs: Get medical advice/attention.
For minor skin contact, avoid spreading material on unaffected skin.
Remove and isolate contaminated clothing and shoes.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

IF SWALLOWED

Rinse mouth. Do NOT induce vomiting.
Call a POISON CENTER/doctor/physician if you feel unwell.

Most important symptoms and effects, both acute and delayed
Specific information on symptom and effect are unknown.

Indication of any immediate medical attention and special treatment needed

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

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use appropriate extinguishing media suitable for surrounding facilities.
The product is non-flammable.

Unsuitable extinguishing media

Unsuitable extinguishing media data is not available.

Specific hazards arising from the substance or mixture

Containers may explode when heated.
Fire may produce irritating, corrosive and/or toxic gases.
Runoff from fire control or dilution water may cause pollution.

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.

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Wear protective gloves/protective clothing/eye protection/face protection.
Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Keep unauthorized personnel away.

In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

Ventilate area until material pick up is complete.

Wear proper protective equipment.

PUBLIC SAFETY: Ventilate closed spaces before entering.

Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

EVACUATION : Spill: See the Table of Initial Isolation and Protective Action Distances for highlighted substances. For non-highlighted substances, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Environmental precautions

Avoid release to headsprings, rivers, lakes, ocean and groundwater.

Methods and materials for containment and cleaning up

Use clean non-sparking tools to collect absorbed material.

All equipment used when handling the product must be grounded.

Cover with DRY earth, DRY sand, or other non-combustible material followed with plastic sheet to minimize spreading or contact with rain.

Preventive measures for secondary accident

Collect spillage.

Stop leak if you can do it without risk.

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

Prevent entry into waterways, sewers, basements or confined areas.

Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material.

Do not get water inside containers.

Keep out of low areas.

Section 7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/mist.

(Protective measures against fire and explosion)

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

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

Safety Measures

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

Use personal protective equipment as required.

When using do not eat, drink or smoke.

Fire or Explosion : Vapors may accumulate in confined areas (basement, tanks, hopper/tank cars etc.).

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Any incompatibilities

Bases, Metals should not be mixed with the chemicals.

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Do not eat, drink or smoke when using this product.

Wash contaminated clothing before reuse.

Storage

Conditions for safe storage

Store in a well-ventilated place. Keep container tightly closed.

Keep cool. Protect from sunlight.

Store in accordance with local/national regulation.

Store locked up.

Container and packaging materials for safe handling data is not available.

Specific end use(s)

See information in Section 7.1 and 7.2 for handling and storage recommendations. See Section 8 for exposure controls and personal protection recommendations.

Section 8. Exposure controls/personal protection

Control parameters

Control value

(Hydrofluoric acid)

Japan control value (2009) $\leq 0.5\text{ppm}$

Adopted value

(Sulfuric acid)

JSOH(2000) (ceiling) $1\text{mg}/\text{m}^3$

ACGIH(2004) TWA: $0.2\text{mg}/\text{m}^3(\text{T})$ (Pulm func)

(Hydrofluoric acid)

JSOH(2020) (ceiling) 3ppm ; $2.5\text{mg}/\text{m}^3$ (skin)

ACGIH(2004) TWA: 0.5ppm ;

STEL: C 2ppm (URT, LRT, skin & eye irr; fluorosis)

Notation···Skin

(Zirconium (IV) sulfate)

Adopted value in JSOH is not available.

ACGIH(1996) TWA: $5\text{mg-Zr}/\text{m}^3$

STEL: $10\text{mg-Zr}/\text{m}^3$ (Resp irr)

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection.

Recommended respiratory protection : Self-Contained Breathing Apparatus (SCBA) or
Gas mask(JIS T8152)

Hand protection

Wear protective gloves. Recommended material(s): neoprene, nitrile, butyl rubber, viton, PVC,
impermeable or chemical resistant rubber

Inspect before use and replace worn or damaged gloves.

Contact the glove manufacturer for specific advice on glove selection and breakthrough
times for your use conditions.

Chemical-resistant, impervious gloves complying with an approved standard (e.g. JIS T8116)
should be used.

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Eye protection

Wear chemical safety goggle.

Wear eye/face protection.

Skin and body protection

Wear impervious clothing and boots in case of repeated or prolonged treatment.

Personal protective equipment for the body and skin should be selected based on the task being performed and the risks involved.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Colorless

Odor data is not available.

Odor threshold data is not available.

Melting point/Freezing point data is not available.

Boiling point or initial boiling point data is not available.

Boiling range data is not available.

Flammability (gases, liquids and solids): Non-flammable

Lower and upper explosion limit/flammability limit data is not available.

Flash point: Non-flammable

Auto-ignition temperature data is not available.

Decomposition temperature data is not available.

Self-Accelerating Decomposition Temperature/SADT data is not available.

pH: pH \leq 2(Strong acidic)

Dynamic viscosity data is not available.

Kinematic viscosity data is not available.

Solubility:

Solubility in water: Miscible

Solubility in solvent data is not available.

n-Octanol/water partition coefficient data is not available.

Vapor pressure data is not available.

Vapor density data is not available.

Density and/or relative density data is not available.

Relative vapor density (Air=1) data is not available.

Relative density of the Vapor/air - mixture at 20°C (Air = 1) data is not available.

Particle characteristics data is not available.

Other information

Critical temperature data is not available.

Evaporation rate data is not available.

VOC data is not available.

Other information is not available.

Section 10. Stability and Reactivity

Reactivity

Reactivity data is not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

Hazardous decomposition products will be formed at elevated temperatures.

Conditions to avoid

Contact with incompatible materials.

Heating.

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Incompatible materials

Bases, Metals

Hazardous decomposition products

Sulfur oxides, Metal oxides, Fluorides

Section 11. Toxicological Information

The product has not been subjected to toxicological testing. Refer to the available data on the constituents.

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[Product]

Based on available data, the classification criteria are not met.

[Data for components of the product]

[GHS Cat. Japan, base data]

(Sulfuric acid)

rat LD50=2140mg/kg (AICIS IMAP, 2015)

(Hydrofluoric acid)

human LD=1.5g or 20mg/kg (Clinical Toxicology, 2009)

Acute toxicity (Dermal)

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

[GHS Cat. Japan, base data]

(Hydrofluoric acid)

It has been reported that chemical burns of 7% body surface area by 50~70% hydrofluoric acid can be fatal. (Clinical Toxicology, 2009)

Acute toxicity (Inhalation)

[Product]

Category 4, Harmful if inhaled

[Data for components of the product]

[GHS Cat. Japan, base data]

(Sulfuric acid)

mist: rat LC50=0.375mg/L/4hr (OECD TG 403) (AICIS IMAP, 2015)

(Hydrofluoric acid)

It has been reported that the lethal concentration of fume is 50~250ppm (mist converted value: 0.0008-0.004mg/L/4hr) or more. (Clinical Toxicology, 2009)

Irritant properties

Skin corrosion/irritation

[Product]

Category 1B, Causes severe skin burns and eye damage

※Classification based on the following set of data.

[Product data]

[GHS Cat. based on pH]

pH ≤ 2, accordingly Skin corrosion/irritation: Category 1

[Data for components of the product]

[GHS Cat. Japan, base data]

(Sulfuric acid)

corrosive and irritation (AICIS IMAP, 2015)

(Hydrofluoric acid)

rabbit (OECD TG404, 5% aqueous solution) : destruction of skin tissue, not recover within 14days

(REACH Registration dossier, Accessed Nov. 2021)

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[Company proprietary data]

(Sulfuric acid)

This substance is strongly acidic and causes severe skin irritation. Thus, it was classified into category 1B.
(Supplier's data/informatio)

(Hydrofluoric acid)

When this substance adheres to the skin and mucous membranes, it causes strong painful corrosion locally, causing systemic effects and death in some cases. In addition, the "GHS Cat. Japan, base data" was also taken into account and classified as Category 1B. (Supplier's data/informatio)

Serious eye damage/irritation

[Product]

Category 1, Causes serious eye damage

[Product data]

[GHS Cat. based on pH]

pH <= 2, accordingly Serious eye damage/eye irritation: Category 1

[Data for components of the product]

[GHS Cat. Japan, base data]

(Sulfuric acid)

corrosive and irritation (AICIS IMAP, 2015)

(Hydrofluoric acid)

Anterior eye disorder (Simple chemical substances or compounds (including alloys)

designated by the Minister of Labor based on the Ordinance for Enforcement of the Labor Standards Act, MOL Announcement No. 33, 1996)

Sensitization

Respiratory sensitization

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Skin sensitization

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Germ cell mutagenicity

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Carcinogenicity

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

[IARC]

(Sulfuric acid)

Group 1 : Carcinogenic to humans

[ACGIH]

(Zirconium (IV) sulfate)

A4(as Zr)(1996) : Not Classifiable as a Human Carcinogen

(Sulfuric acid)

A2(2004) : Suspected Human Carcinogen

[NTP]

(Sulfuric acid)

Known : Known to be Human Carcinogens

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Reproductive toxicity

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Specific target organ toxicity (STOT)

STOT-single exposure

[Product]

Category 2, May cause damage to organs

[Data for components of the product]

[cat.1]

[GHS Cat. Japan, base data]

(Sulfuric acid)

respiratory system (DFG MAK, 2001)

STOT-repeated exposure

[Product]

Category 2, May cause damage to organs through prolonged or repeated exposure

[Data for components of the product]

[cat.1]

[GHS Cat. Japan, base data]

(Sulfuric acid)

respiratory system (AICIS IMAP, 2015)

Aspiration hazard

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Section 12. Ecological Information

The product has not been subjected to ecotoxicological testing. Refer to the available data on the constituents.

Toxicity

Aquatic toxicity

[Product]

Category 2, Toxic to aquatic life with long lasting effects

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[GHS Cat. Japan, base data]

(Sulfuric acid)

Fish (bluegill) LC50(pH3.25-3.5)=16-28mg/L/96hr (OECD SIDS, 2001)

(Hydrofluoric acid)

Crustacea (Gammaridea) EC50=73.3mg/L/96hr (Calculated from test data of NaF

(EC50=38.28mg-F/L/96hr)) (ECETOC TR91, 2003)

Hazardous to the aquatic environment, long-term (chronic)

[GHS Cat. Japan, base data]

(Sulfuric acid)

Fish (Gambusia affinis) NOEC(pH6.0)=0.025mg/L/45days (OECD SIDS, 2001)

(Hydrofluoric acid)

Fish (Atheriniformes) NOEC >=8.6mg/L/28days(Calculated from test data of NaF(NOEC=9.9mg/L/28days))

(Results of Aquatic Toxicity Tests of Chemicals conducted by MOE in Japan, 2017)

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Water solubility

[Data for components of the product]

(Sulfuric acid)

miscible (ICSC, 2016)

(Hydrofluoric acid)

very good (ICSC, 2017)

Persistence and degradability

Persistence and degradability data is not available.

Bioaccumulative potential

Bioaccumulative potential data is not available.

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Avoid release to the environment.

Dispose of contents/container in accordance with local/national regulation.

Section 14. Transport Information

UN No., UN CLASS

UN Number or ID Number : 2796

UN Proper Shipping Name : SULPHURIC ACID with not more than 51% acid or BATTERY FLUID, ACID

Class or division (Transport hazard class) : 8

Packing group : II

ERG GUIDE No.: 157

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 2796

UN Proper Shipping Name : SULPHURIC ACID with not more than 51% acid or BATTERY FLUID, ACID

Class or division (Transport hazard class) : 8

Packing group : II

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 2796

UN Proper Shipping Name :SULPHURIC ACID with not more than 51% acid or BATTERY FLUID, ACID

Class or division (Transport hazard class) : 8

Hazard labels : Corrosive

Packing group : II

Environmental hazards

Marine pollutants (yes/no) : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Noxious Liquid Substances ; Cat. Y

Sulfuric acid

Non Noxious Liquid Substances ; Cat. OS

Water

MARPOL Annex V – HME (Harmful to the Marine Environment)

Specific target organ toxicity – repeated exposure: cat.1

Sulfuric acid

Hazardous to the aquatic environment – long-term (chronic): cat.1, 2

Sulfuric acid

Section 15. Regulatory Information

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

Labor Standards Act, Japan

Chemical substances or compounds (including alloys) causing disease (Regulation, Appended Table 1-2-4-1)

Sulfuric acid; Hydrofluoric acid

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

7732-18-5; 7664-39-3; 7664-93-9; 14644-61-2

All components are listed or exempted.

Superfund Amendments and Reauthorizations Act (SARA), Title III

SARA 313 (TRI)

Sulfuric acid

Other regulatory information

We are not able to check up the regulatory information with regard to the substances in your country or region, therefore, we request this matter would be filled by your responsibility.

Regulatory information with regard to this substance in your country or in your region should be examined by your own responsibility.

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

Regulatory information in this section are limited to intentional ingredient(s), but does not contain information on non-intentional ingredients or impurities which are not informed by supplier(s).

Chemical safety assessment

Advice on safe handling for this product can be found in sections 7 and 8 of this SDS.

Section 16. Other information

GHS classification and labelling

H332-Acute toxicity, Category 4: H332 Harmful if inhaled

H314-Skin corrosion/irritation, Category 1B: H314 Causes severe skin burns and eye damage

H318-Serious eye damage/eye irritation, Category 1: H318 Causes serious eye damage

H371-STOT - single exposure, Category 2: H371 May cause damage to organs

H373-STOT - Repeated exposure, Category 2: H373 May cause damage to organs through prolonged or repeated exposure

H411-Hazardous to the aquatic environment, long-term (chronic), Category 2: H411 Toxic to aquatic life with long lasting effects

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 22nd edit., 2021 UN

IMDG Code, 2020 Edition (Incorporating Amendment 40-20)

IATA Dangerous Goods Regulations (64th Edition) 2023

2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2023 TLVs and BEIs. (ACGIH)

JIS Z 7252 : 2019

JIS Z 7253 : 2019

2022 Recommendation on TLVs (JSOH)

Notification No. 0111-1 (January 11, 2022), Chemical Hazards Control Division, Industrial

Safety and Health Department, Labour Standards Bureau, MHLW in Japan

Supplier's data/information

Chemicals safety data management system "GHS Assistant" Version 4.25 (<https://www.asahi-ghs.com/>)

NITE Chemical Risk Information Platform "NITE-CHRIP"

(https://www.nite.go.jp/en/chem/chrip/chrip_search/systemTop)

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GHS Classification Guidance for Enterprises 2019 Revised Edition (Ver. 2.0) (Mar. 2020, METI)

Abbreviations and acronyms

SDS (Safety Data Sheet)
LD50 (Lethal Dose, 50%)
LC50 (Lethal Concentration, 50%)
IARC (International Agency for Research on Cancer)
ACGIH (American Conference of Governmental Industrial Hygienists)
EPA (US Environmental Protection Agency)
NTP (US National Toxicology Program)
JSOH (Japan Society for Occupational Health)
EU (European Union)
EC50 (Effective Concentration, 50%)
NOEC (No Observed Effect Concentration)
BOD (Biochemical Oxygen Demand)
COD (Chemical Oxygen Demand)
BCF (Bioconcentration Factor)
anh (anhydride)

General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2022).