



## Safety Data Sheet

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

Product identifier:

Product name: (S)-N-Fmoc- $\alpha$ -Methylaspartic acid -4-tert-butyl ester

SDS No. : KUA0044E-3

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

Research and Development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Chemical Safety Management Department

Telephone number: +81-6-6946-8061

FAX: +81-6-6946-1607

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### Section 2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

HEALTH HAZARDS

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2B

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

Label elements



Signal word: Warning

HAZARD STATEMENT

H315 Causes skin irritation

H320 Causes eye irritation

PRECAUTIONARY STATEMENT

Prevention

P264 Wash contaminated parts thoroughly after handling.

P280 Wear protective gloves.

Response

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P332 + P313 If skin irritation occurs: Get medical advice/attention.

P362 + P364 Take off contaminated clothing and wash it before reuse.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 If eye irritation persists: Get medical advice/attention.

Specific adverse human health effects

See "11. Toxicological Information".



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**Section 3. Composition/information on ingredients**

Mixture/Substance selection:

Mixture

Ingredient name	Content (%)	CAS No.	ENCS	Chemical formula
(S)-N-Fmoc- $\alpha$ -Methylaspartic acid -4-tert-butyl ester	–	1072845-47-6	–	C <sub>24</sub> H <sub>27</sub> NO <sub>6</sub>
tert-Butyl methyl ether	≤10	1634-04-4	2-3220	(CH <sub>3</sub> ) <sub>3</sub> COCH <sub>3</sub>

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

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**Section 4. First-aid measures**

Descriptions of first-aid measures

**IF INHALED**

Remove person to fresh air and keep comfortable for breathing.  
Call a POISON CENTER/doctor/physician if you feel unwell.

**IF ON SKIN**

Take off immediately all contaminated clothing. Rinse skin with water or shower.  
Wash with plenty of soap and water.  
If skin irritation or rash occurs: Get medical advice/attention.

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

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**Section 5. Fire-fighting measures**

Extinguishing media

Suitable extinguishing media

Use appropriate extinguishing media suitable for surrounding facilities.

Unsuitable extinguishing media

Unsuitable extinguishing media data is not available.

Specific hazards arising from the substance or mixture

Fire may produce irritating, corrosive and/or toxic gases.  
Runoff from fire control or dilution water may cause pollution.  
See "10.Stability and Reactivity".

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.  
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.



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**Section 6. Accidental release measures**

Personnel precautions, protective equipment and emergency procedures

Keep unauthorized personnel away.

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses, low areas or rivers. To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for containment and cleaning up

Sweep up, place in a bag and hold for waste disposal.

Preventive measures for secondary accident

Collect spillage.

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**Section 7. Handling and storage**

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

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

(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

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

Wash hands et al thoroughly after handling.

When using do not eat, drink or smoke.

Any incompatibilities

See "10.Stability and Reactivity".

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Take off contaminated clothing and wash it before reuse.

Storage

Conditions for safe storage

Keep container tightly closed.

Frozen storage.

Storage in accordance with local/national regulation.

Container and packaging materials for safe handling

Use closed unbreakable containers.

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**Section 8. Exposure controls/personal protection**

Control parameters

Control value and Concentration standard value



(S)-N-Fmoc- $\alpha$ -Methylaspartic acid -4-tert-butyl ester ,KUA0044E-3,2024/10/04

(tert-Butyl methyl ether)

Concentration standard value TWA: 50ppm

Adopted value

(Other inorganic and organic dust (third class dust ))

JSOH Respirable dust 2mg/m<sup>3</sup>, Total dust 8mg/m<sup>3</sup>

(tert-Butyl methyl ether)

ACGIH(2002) TWA: 50ppm (URT irr; kidney dam)

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

Recommend to use protective equipment in conformity with the standards.

Use appropriate protective equipment in accordance with local/national regulation.

Respiratory protection

Wear respiratory protection (dust-proof mask/gas mask). Select chemical cartridge corresponding to type of gases when using a gas mask.

Hand protection

Wear impervious protective glove.

Eye protection

Wear eye/face protection. Wear safety goggles in cases gas is generated.

Skin and body protection

Wear protective clothing.

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## Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Powder

Color: White to pale yellow

Odor 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) data is not available.

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

Flash point data is not available.

Auto-ignition temperature data is not available.

Decomposition temperature data is not available.

pH data is not available.

Kinematic viscosity data is not available.

Solubility:

Solubility in water data is not available.

Solubility in solvent data is not available.

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

Vapor pressure data is not available.

Density and/or relative density data is not available.

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

Particle characteristics data is not available.



(S)-N-Fmoc- $\alpha$ -Methylaspartic acid -4-tert-butyl ester ,KUA0044E-3,2024/10/04

Other information

Other information is not available.

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## Section 10. Stability and Reactivity

### Reactivity

Not available.

### Chemical stability

Stable under normal storage/handling conditions.

### Possibility of hazardous reactions

(tert-Butyl methyl ether)

Reacts violently with strong oxidants. This generates fire hazard. Decomposes on contact with acids. (ICSC 1164)

### Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

### Incompatible materials

Acids, Strong oxidizing agents

### Hazardous decomposition products

Carbon oxides, Nitrogen oxides

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## Section 11. Toxicological Information

### Information on toxicological effects

#### Acute toxicity

##### Acute toxicity (Oral)

[Data for components of the product]

[GHS Cat. Japan, base data]

(tert-Butyl methyl ether)

rat LD50=2963mg/kg (IARC 73, 1999; ACGIH 7th, 2002) et al.

##### Acute toxicity (Dermal)

[Data for components of the product]

[GHS Cat. Japan, base data]

(tert-Butyl methyl ether)

rabbit LD50=10000mg/kg (EHC 206, 1998; DFGOT vol. 17, 2002) et al.

##### Acute toxicity (Inhalation)

[Data for components of the product]

[GHS Cat. Japan, base data]

(tert-Butyl methyl ether)

vapor:rat LC50=23576ppm (ACGIH, 7th, 2002), 85mg/L (23800ppm) (EU-RAR, 2002), 86mg/L (24080ppm) (IARC 73, 1999), 33370ppm (ATSDR, 1996; EU-RAR, 2002; PATTY 6th, 2012), 39395ppm (PATTY 6th, 2012; EU-RAR, 2002), 85-142mg/L (2,800-39,760ppm) (DFGOT vol. 17, 2002) < 90% of saturated vapor press. (267327ppm)

#### Irritant properties

##### Skin corrosion/irritation

[Product]

Category 2, Causes skin irritation

[Data for components of the product]

[GHS Cat. Japan, base data]



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(tert-Butyl methyl ether)

rabbit severe edema and moderate erythema (EU-RAR, 2002); EU CLP Skin Irrit. 2 (ECHA CL Invt., Access on Jun. 2017)

Serious eye damage/irritation

[Product]

Category 2B, Causes eye irritation

[Data for components of the product]

[GHS Cat. Japan, base data]

(tert-Butyl methyl ether)

rabbit eyes irritation (DFGOT vol.17, 2002)

Allergenic and sensitizing effects data is not available.

Mutagenic effects data is not available.

Carcinogenicity

[Data for components of the product]

[IARC]

(tert-Butyl methyl ether)

Group 3 : Not classifiable as to its carcinogenicity to humans

[ACGIH]

(tert-Butyl methyl ether)

A3(2002) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

Reproductive toxicity data is not available.

Specific target organ toxicity (STOT)

STOT-single exposure

[Data for components of the product]

[cat.3 (respiratory tract irritation)]

[GHS Cat. Japan, base data]

(tert-Butyl methyl ether)

respiratory tract irritation (EHC 206, 1998; ACGIH 7th, 2002; EU-RAR, 2002; ATSDR, 1996)

[cat.3 (narcotic effects)]

[GHS Cat. Japan, base data]

(tert-Butyl methyl ether)

narcotic effect (EHC 206, 1998; ACGIH 7th, 2002; DFGOT vol.17, 2002; EU-RAR, 2002; IARC 73, 1999; IRIS, 2005)

STOT-repeated exposure data is not available.

Aspiration hazard data is not available.

Information on other hazards

May cause lung disorders by massive inhalation of powdered substance.

-e.g. fibrosis of lung tissue, cough, sputum, breath shortness, dyspnea, decline of lung function, interstitial lung disease, pneumothorax

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## Section 12. Ecological Information

Toxicity

Aquatic toxicity

[Data for components of the product]

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

[GHS Cat. Japan, base data]

(tert-Butyl methyl ether)

Algae (*Pseudokirchneriella subcapitata*) EC50 (speed method) >110mg/L/72hr (MOE Japan, 2017)



(S)-N-Fmoc- $\alpha$ -Methylaspartic acid -4-tert-butyl ester ,KUA0044E-3,2024/10/04

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

[GHS Cat. Japan, base data]

(tert-Butyl methyl ether)

Crustacea (Daphnia magna) NOEC (Reproductive inhibition)=11mg/L/21days, Algae

(Pseudokirchneriella subcapitata) NOEC (Speed method) >110mg/L/72hr (Both are MOE Japan, 2017)

Water solubility

(tert-Butyl methyl ether)

5.1 g/100 ml (PHYSPROP\_DB, 2005)

Persistence and degradability

[Data for components of the product]

(tert-Butyl methyl ether)

Not rapidly degradable (BOD\_Ave. Degradation:0% (CSCL DB, 2002))

Bioaccumulative potential

[Data for components of the product]

(tert-Butyl methyl ether)

log Pow=1.06 (ICSC, 2000)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

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### 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

Dispose of contents/container as industrial waste. Accordance with local/national regulation.

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### Section 14. Transport Information

UN Number or ID Number : Not regulated

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : Not regulated

IATA (Dangerous Goods Regulations)

UN Number or ID Number : Not regulated

Environmental hazards

Marine pollutants (yes/no) : no

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### Section 15. Regulatory Information

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

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

Chemicals listed in TSCA Inventory

tert-Butyl methyl ether

Other regulatory information

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



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**Section 16. Other information**

## 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, 2022 Edition (Incorporating Amendment 41-22)  
IATA Dangerous Goods Regulations (65th Edition) 2024  
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)  
2024 TLVs and BEIs. (ACGIH)  
JIS Z 7252 : 2019  
JIS Z 7253 : 2019  
2023 Recommendation on TLVs (JSOH)  
Supplier's data/information

## General Disclaimer

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Unauthorized translation or modification is prohibited.

Please provide SDS to customers for selling or transferring.

All chemicals have unknown hazard. Handle the product with care.

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).