1. Identification of the substance/mixture and of the company/undertaking
   Product identifier:
   Product name: LiFSI
   Product code (SDS NO): 4528E-3

Details of the supplier of the safety data sheet
   Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.
   Address: 3-1, Honmachibashi, Chuoku, Osaka, JAPAN
   Division: Safety Management Dept. of Chemicals
   Telephone number: +81-6-6946-8061
   FAX: +81-6-6946-1607
   e-mail address: kagakuhinanzenkanri@kishida.co.jp

2. Hazards identification
   GHS classification and label elements of the product
   Classification of the substance or mixture
   HEALTH HAZARDS
   Acute toxicity (Oral): Category 3
   Skin corrosion/irritation: Category 1B
   Serious eye damage/eye irritation: Category 1
   Reproductive toxicity: Category 1

   ENVIRONMENT HAZARDS
   Hazardous to the aquatic environment (Acute): Category 3
   (Note) GHS classification without description: Not classified/Classification not possible

   Label elements

   Signal word: Danger
   HAZARD STATEMENT
   Toxic if swallowed
   Causes severe skin burns and eye damage
   Causes serious eye damage
   May damage fertility or the unborn child
   Harmful to aquatic life

   PRECAUTIONARY STATEMENT
   Prevention
   Avoid release to the environment.
   Do not breathe dust/fume/gas/mist/vapors/spray.
   Wash contaminated parts thoroughly after handling.
   Wear protective gloves, protective clothing or face protection.
   Wear eye protection/face protection.
   Do not eat, drink or smoke when using this product.

   Response
   IF exposed or concerned: Get medical advice/attention.
   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/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: Immediately call a POISON CENTER or doctor/physician.
Disposal
Dispose of contents/container in accordance with local/national regulation.

3. Composition/information on ingredients
Mixture/Substance selection:
    Substance
        Ingredient name: Lithium bis(fluorosulfonyl)imide
        Content (%): 99(min)
        Chemical formula: LiN(SO₂F)₂
        Chemicals No, Japan: 1-1247
        CAS No.: 171611-11-3
        MW: 187.07
    Note: The figures shown above are not the specifications of the product.

4. First-aid measures
Descriptions of first-aid measures
    General measures
        IF exposed or concerned: Get medical attention/advice.
        Immediately call a POISON CENTER or doctor/physician.
        IF INHALED
        Remove person to fresh air and keep comfortable for breathing.
        Call a POISON CENTER or doctor/physician if you feel unwell.
        IF ON SKIN (or hair)
        Take off immediately all contaminated clothing. Rinse skin with water/shower.
        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. Do NOT induce vomiting.
        Immediately call a POISON CENTER or doctor/physician.

5. Fire-fighting measures
Extinguishing media
    Suitable extinguishing media
        Use appropriate extinguishing media suitable for surrounding facilities.
    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.
Advice for firefighters
    Specific fire-fighting measures
        Evacuate non-essential personnel to safe area.
    Special protective equipment and precautions for fire-fighters
        Wear fire/flame resistant/retardant clothing.
Wear protective gloves/protective clothing/eye protection/face protection. Firefighters should wear self-contained breathing apparatus with full face piece operated positive pressure mode.

6. Accidental release measures
   Personnel precautions, protective equipment and emergency procedures
   Ventilate area until material pick up is complete.
   Wear proper protective equipment.
   Environmental precautions
   Prevent spills from entering sewers, watercourses or low areas.
   Avoid raising dust.
   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.

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/sparks/open flames/hot surfaces. - 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 or face protection.
   Wear eye protection/face protection.
   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.
   Do not eat, drink or smoke when using this product.
   Wash contaminated clothing before reuse.
   Storage
   Conditions for safe storage
   Keep container tightly closed.
   Store in a cool, dry place. Do not store in direct sunlight.
   Container and packaging materials for safe handling
   Glass

8. Exposure controls/personal protection
   Control parameters
   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.

Hand protection
  Wear protective gloves.

Eye protection
  Wear eye/face protection.

9. Physical and Chemical Properties

Information on basic physical and chemical properties
  Physical state: Crystal or powder
  Color: White to light cream
  Odor: Odourless
  pH data is not available.
  Boiling point or initial boiling point data is not available.
  Boiling range data is not available.
  Melting point/Freezing point data is not available.
  Decomposition temperature data is not available.
  Flammability (gases, liquids and solids) data is not available.
  Flash point data is not available.
  Auto-ignition temperature data is not available.
  Lower and upper explosion limit/flammability limit data is not available.
  Vapor pressure data is not available.
  Relative vapor density (Air=1) data is not available.
  Density and/or relative density data is not available.
  Kinematic viscosity data is not available.

Solubility:
  Solubility in water: Soluble
  n-Octanol/water partition coefficient data is not available.

No Particle characteristics data is not available.

10. Stability and Reactivity

Reactivity
  Not available.

Chemical stability
  Stable under normal storage/handling conditions.

Possibility of hazardous reactions
  Not available.

Conditions to avoid
  Contact with incompatible materials.
  Contact with fire source.

Incompatible materials
  Acids, Bases, Oxidizing agents, Reducing agents

Hazardous decomposition products
  Sulfur oxides, Nitrogen oxides, HF
11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)
[Company proprietary data]
(Lithium bis(fluorosulfonyl)imide)
rat LD50: 50-300mg/kg

Acute toxicity (Dermal)
[Company proprietary data]
(Lithium bis(fluorosulfonyl)imide)
rat LD50: >2500mg/kg

Irritant properties

Skin corrosion/irritation
[Company proprietary data]
(Lithium bis(fluorosulfonyl)imide)
rabbit Corrosive

Serious eye damage/irritation
[Company proprietary data]
(Lithium bis(fluorosulfonyl)imide)
Category 1

Allergenic and sensitizing effects data is not available.

Germ cell mutagenicity
[Company proprietary data]
(Lithium bis(fluorosulfonyl)imide)
Ames test: negativity
chromosomal aberration test: negativity
micronucleus test: negativity

Reverse-mutation assay in bacteria (Ames test): Negative
Chromosome aberration test: Negative

Carcinogenic effects data is not available.

Reproductive toxicity
[Company proprietary data]
(Lithium bis(fluorosulfonyl)imide)
NOAEL 72.07mg/kg/day (Female rat)
NOAEL 69.21mg/kg/day (Male rat)

STOT
STOT—single exposure data is not available.
STOT—repeated exposure data is not available.

Aspiration hazard data is not available.

Additional data
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

12. Ecological Information

Ecotoxicity

Aquatic toxicity

Harmful to aquatic life

Aquatic acute toxicity component(s) data
[Company proprietary data]
(Lithium bis(fluorosulfonyl)imide)
LC50(96hr): >100mg/L (Oryzias latipes)
LC50(96hr):>100mg/L (Zebrafish)
EC50(48hr):71mg/L (Ceriodaphnia dubia)

Aquatic chronic toxicity component(s) data
[Company proprietary data]
(Lithium bis(fluorosulfonyl)imide)
NOEC(14day):>101mg/L (Ceriodaphnia dubia)
NOEC(21day):>7.06mg/L (Ceriodaphnia dubia)

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.

13. Disposal considerations
Waste treatment methods
Avoid release to the environment (~ if this is not the intended use).
Dispose of contents/container in accordance with local/national regulation.

14. Transport Information
UN No.: 2923
Proper Shipping Name:
CORROSIVE SOLID, TOXIC, N.O.S.
Class or division: 8
Subsidiary hazard(s): 6.1
Packing group: II
ERG GUIDE No.: 154
Special provisions No.: 274
IMDG Code (International Maritime Dangerous Goods Regulations)
UN No.: 2923
Proper Shipping Name:
CORROSIVE SOLID, TOXIC, N.O.S.
Class or division: 8
Subsidiary hazard(s): 6.1
Packing group: II
Special provisions No.: 274
IATA Dangerous Goods Regulations
UN No.: 2923
Proper Shipping Name:
CORROSIVE SOLID, TOXIC, N.O.S.
Class or division: 8
Subsidiary hazard(s): 6.1
Hazard labels: Corrosive & Toxic
Packing group: II
Special provisions No.: A3, A803

Environmental hazards
MARPOL Annex III – Prevention of pollution by harmful substances
Marine pollutants (yes/no): no
MARPOL Annex V – Prevention of pollution by garbage discharge
Reproductive toxicity: cat.1, 1A, 1B
15. Regulatory Information
Safety, health and environmental regulations/legislation specific for the substance or mixture
US major regulations
TSCA
Lithium bis(fluorosulfonyl)imide
Other regulatory information
Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information
GHS classification and labelling
Acute Tox. 3: H301 Toxic if swallowed
Skin Corr. 1B: H314 Causes severe skin burns and eye damage
Eye Dam. 1: H318 Causes serious eye damage
Repr. 1: H360 May damage fertility or the unborn child
Aquatic Acute 3: H402 Harmful to aquatic life
Reference Book
Globally Harmonized System of classification and labelling of chemicals, (6th ed., 2015), UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 20th edit., 2017 UN
IMDG Code, 2018 Edition (Incorporating Amendment 39–18)
IATA Dangerous Goods Regulations (60th Edition) 2019
Classification, labelling and packaging of substances and mixtures (table3–1 ECNO6182012)
2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2019 TLVs and BEIs. (ACGIH)
http://monographs.iarc.fr/ENG/Classification/index.php
Supplier’s data/information
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
2018).