SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name: Buffer HF-Improved

Stock number: 44627

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

Identified use: SU24 Scientific research and development

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Thermo Fisher (Kandel) GmbH
Zeppelinstr. 7b
76185 Karlsruhe / Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300
Email: tech@alfa.com
www.alfa.com
Informing department: Product safety Tel +49 (0) 7275 988687-0

1.4 Emergency telephone number:
Carechem 24: +44 (0) 1235 239 670 (Multi-language emergency number)
Poison Information Center Mainz
www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

GHS06 skull and crossbones
Acute Tox. 3 H301 Toxic if swallowed.
Acute Tox. 2 H310 Fatal in contact with skin.
Acute Tox. 3 H331 Toxic if inhaled.

GHS05 corrosion
Skin Corr. 1A H314 Causes severe skin burns and eye damage.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC
T; Toxic
R23/24/25: Toxic by inhalation, in contact with skin and if swallowed.
C; Corrosive
R34: Causes burns.
Xi; Irritant
R37: Irritating to respiratory system.

Information concerning particular hazards for human and environment:
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008
The product is classified and labelled according to the CLP regulation.

Signal word Danger

Hazard-determining components of labelling:
Ammonium fluoride
Hydrogen fluoride

Hazard statements
H301 Toxic if swallowed.
H310 Fatal in contact with skin.
H311 Toxic if inhaled.
H314 Causes severe skin burns and eye damage.

Precautionary statements
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/...;
P303+P361+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P311 Take off immediately all contaminated clothing.
P405 Store locked up.
P531 Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Dangerous components:

CAS: 7784-39-3
Index number: 009-002-00-6

Ammonium fluoride
CAS: 12125-01-8
Index number: 009-006-00-8

Acute Tox. 3, H301; Acute Tox. 3, H311; Acute Tox. 3, H331

Additional information None known.
SECTION 4: First aid measures

4.1 Description of first aid measures

General information
Special First Aid training required.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident. Instantly remove any clothing soaked by the product. Remove breathing apparatus only after soaked clothing has been completely removed. In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist. Seek immediate medical advice.

After skin contact
Instantly wash with water and soap and rinse thoroughly. Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult doctor.

After swallowing
Do not induce vomiting; instantly call for medical help.

4.2 Most important symptoms and effects, both acute and delayed

Causes severe skin burns.
Causes serious eye damage.

4.3 Indication of any immediate medical attention and special treatment needed

No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents
Product is not flammable. Use fire-fighting measures that suit the surrounding fire.

5.2 Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:
Hydrogen fluoride (HF)
Nitrogen oxides (NOx)
Ammonia

5.3 Advice for firefighters

Protective equipment:
Wear self-contained breathing apparatus.
Wear full protective suit.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

6.2 Environmental precautions:

Do not allow product to reach sewage system or water bodies.

6.3 Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralizing agent.
Dispose of contaminated material as waste according to section 13.
Ensure adequate ventilation.

Prevention of secondary hazards:
No special measures required.

6.4 Reference to other sections

See Section 7 for information on safe handling.
See section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Keep containers tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation/exhaustion at the workplace.
Open and handle container with care.
Prevent formation of aerosols.

Information about protection against explosions and fires: The product is not flammable.

7.2 Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and containers:
Unsuitable material for containers: metals and alloys.
Unsuitable material for container: ceramic, glass.

Information about storage in one common storage facility:
Store away from strong bases.
Store away from metal powders.
Water reacts with many metals to give hydrogen, often violently. Water also reacts violently with many reactive organic and inorganic chemicals.
Store away from amines.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Store in a locked cabinet or with access restricted to technical experts or their assistants.

7.3 Specific end use(s)

No further relevant information available.

SECTION 8: Exposure controls/personal protection

Additional information about design of technical systems:
Property operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

8.1 Control parameters

Components with critical values that require monitoring at the workplace:

7604-33-1 Hydrogen fluoride (6.0%)

AGW (Germany) Long-term value: 0.83 mg/m³, 1 ppm
PEL (USA) Long-term value: 3 ppm as F
REL (USA) Long-term value: 2.5 mg/m³, 3 ppm
Ceiling limit: 5.0 mg/m³, 8 ppm
15-min, as F

TLV (USA) Long-term value: 0.4 mg/m³, 0.5 ppm
Ceiling limit: 1.6 mg/m³, 2 ppm
as F; Skin, BEI

Ingredients with biological limit values:
7664-39-3 Hydrogen fluoride (6.0%)

BGW (Germany) 7.0 mg/g Creatinin
Probenahmezzeitpunkt: Expositionsende bzw. Schichtende
Parameter: Fluorid

4.0 mg/g Creatinin
Untersuchungsmaterial: Urin
Probenahmezzeitpunkt: vor nachfolgender Schicht
Parameter: Fluorid

BEI (USA) 3.0 mg/g Creatinin
Medium: urine
Time: prior to shift
Parameter: Fluorides (background, nonspecific)

10 mg/g Creatinin
Medium: urine
Time: end of shift
Parameter: Fluorides (background, nonspecific)

Additional information: No data

8.2 Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures should be adhered to in handling the chemicals.
Keep away from foodstuffs, beverages and food.
Instantly remove any soiled and impregnated garments.
Wash hands during breaks and at the end of the work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use self-contained respiratory protective device in emergency situations.
Recommended filter device for short term use:
Use a respirator with acid gas cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).

Protection of hands:
Check protective gloves prior to each use for their proper condition.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Material of gloves Impervious gloves
Penetration time of glove material (in minutes) Not determined
Eye protection: Tightly sealed safety glasses.
Full face protection

Body protection: Protective work clothing.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties
General Information
Appearance: Liquid
Colour: Colourless
Smell: Acrid
Odour threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: 103-105 °C
Sublimation temperature / start: Not determined
Inflammability (solid, gaseous) Not determined.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Self-inflammability: Product is not selfigniting.

Danger of explosion: Not determined.
Critical values for explosion:
Lower: Not determined
Upper: Not determined

Steam pressure at 20 °C: 23 hPa
Density at 20 °C: 1.12 g/cm³
Relative density: Not determined.
Vapour density: Not determined.
Evaporation rate: Not determined.

Solubility in / Miscibility with Water: Fully miscible
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
dynamic: Not determined.
kinematic: Not determined.

Solvent content:
Organic solvents: 0.0 %
Solids content: 33.0 %

9.2 Other information No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity No information known.
10.2 Chemical stability Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.
**SECTION 11: Toxicological information**

10.3 Possibility of hazardous reactions
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals. Water reacts violently with alkali metals.

10.4 Conditions to avoid
No further relevant information available.

10.5 Incompatible materials:

- Cyanides
- Sulfides
- Bases
- Metal powders
- Amines

10.6 Hazardous decomposition products:

- Hydrogen fluoride
- Nitrogen oxides (NOx)
- Ammonia

**SECTION 12: Ecological information**

12.1 Toxicity

- Acute toxicity: Toxic in contact with skin. Toxic if inhaled. Toxic if swallowed.

12.2 Persistence and degradability
No further relevant information available.

12.3 Bioaccumulative potential
No further relevant information available.

12.4 Mobility in soil
No further relevant information available.

**SECTION 13: Disposal considerations**

13.1 Waste treatment methods

- Recommendation: Hand over to disposers of hazardous waste. Must be specially treated under adherence to official regulations. Consult state, local or national regulations for proper disposal.

13.2 Uncleaned packagings:

- Recommendation: Disposal must be made according to official regulations. Recommended cleaning agent: Water, if necessary with cleaning agent.

**SECTION 14: Transport information**

14.1 UN Number

- UN2817

14.2 UN proper shipping name

- UN2817 AMMONIUM HYDROGENIFLUORIDE SOLUTION

14.3 Transport hazard class(es)

- ADR: 8 (CT1) Corrosive substances.
- IMDG, IATA: 8+6.1
Trade name **Buffer HF-Improved**

### Packing group
ADR, IMDG, IATA

II

### 14.5 Environmental hazards:
Marine pollutant: No

### 14.6 Special precautions for user
Kemler Number: 86
EMS Number: F-A,S-B

**Warning:** Corrosive substances.

### Segregation groups
Acids, ammonium compounds

### 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

#### Transport/Additional information:

<table>
<thead>
<tr>
<th>ADR</th>
<th>Excepted quantities (EQ): E2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited quantities (LQ): 1L</td>
<td></td>
</tr>
<tr>
<td>Transport category: 2</td>
<td></td>
</tr>
<tr>
<td>Tunnel restriction code: E</td>
<td></td>
</tr>
</tbody>
</table>

**UN "Model Regulation":** UN2817, AMMONIUM HYDROGENIFLUORIDE SOLUTION, 8 (6.1), II

### SECTION 15: Regulatory information

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

**Australian Inventory of Chemical Substances**

All ingredients are listed.

**Standard for the Uniform Scheduling of Drugs and Poisons**

7664-39-3 Hydrogen fluoride [S5, S6, S7]

**National regulations**

**Information about limitation of use:**

Employment restrictions concerning young persons must be observed.

For use only by technically qualified individuals.

**Classification according to VbF:** Not applicable

**Technical instructions (air):**

<table>
<thead>
<tr>
<th>Class</th>
<th>Share in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wasser</td>
<td>61.0</td>
</tr>
<tr>
<td>III</td>
<td>33.0</td>
</tr>
</tbody>
</table>

**Water hazard class:** Water hazard class 2 (Self-assessment): hazardous for water.

**Other regulations, limitations and prohibitive regulations**

**ELINCS (European List of Notified Chemical Substances)**

None of the ingredients is listed.

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.**

None of the ingredients are listed.

**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**

None of the ingredients is listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)**

None of the ingredients is listed.

#### 15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

### SECTION 16: Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Relevant phrases**

<table>
<thead>
<tr>
<th>H300</th>
<th>Fatal if swallowed.</th>
</tr>
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<tr>
<td>H310</td>
<td>Fatal in contact with skin.</td>
</tr>
<tr>
<td>H311</td>
<td>Toxic in contact with skin.</td>
</tr>
<tr>
<td>H314</td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
<tr>
<td>H330</td>
<td>Fatal if inhaled.</td>
</tr>
<tr>
<td>H351</td>
<td>Toxic if inhaled.</td>
</tr>
<tr>
<td>R23/24/25</td>
<td>Toxic by inhalation, in contact with skin and if swallowed.</td>
</tr>
<tr>
<td>R26/27/28</td>
<td>Very toxic by inhalation, in contact with skin and if swallowed.</td>
</tr>
<tr>
<td>R35</td>
<td>Causes severe burns.</td>
</tr>
</tbody>
</table>

**Department issuing SDS:** Global Marketing Department

**Abbreviations and acronyms:**

ADR, Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

vPvB: very Persistent and very Bioaccumulative

ACGIH: American Conference of Governmental Industrial Hygienists (USA)

OSHA: Occupational Safety and Health Administration (USA)

NTP: National Toxicology Program (USA)

IARC: International Agency for Research on Cancer

EPA: Environmental Protection Agency (USA)