1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Xenon difluoride
CHEMICAL FORMULA: XeF2

COMPANY NAME:
PELCHEM: The Chemical Division of NECSA
P O Box 582, Pretoria, 0001, South Africa
Tel: +27-12-305 3396 / Fax: +27-12-305 3728
E-mail: eddyv@aec.co.za / Mobile: +27-83 628 0831
Emergency tel: +27-12-305 3333/4

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME OF SUBSTANCE: Xenon difluoride
SYNONYMS: Xenon fluoride (XeF2); Xenon difluoride (XeF2); Xenon (II) fluoride; F2Xe.

CONCENTRATION: 100%
UN No: UN1479
EINECS No: 237-251-2
CAS-No: 13709-36-9

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Colourless to white crystals.
Strong oxidizer that may ignite or explode on contact with combustible materials. Contact with water or moist air may generate toxic gases.
May cause pulmonary edema and chemical pneumonitis. The product hydrolyses to yield hydrofluoric acid and thus symptoms will be similar to those of hydrofluoric acid.

4. FIRST AID MEASURES

a. INHALATION:
SHORT TERM EXPOSURE: Same as effects reported in short term ingestion, irritation (possibly severe), nausea, difficulty breathing, asthma, lung congestion.
LONG TERM EXPOSURE: Same as effects reported in short term exposure.
Remove from exposure immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention.

b. SKIN CONTACT:
SHORT TERM EXPOSURE: Same as effects reported in short term ingestion, irritation (possible severe).
LONG TERM EXPOSURE: Same as effects reported in short term exposure.
Remove contaminated clothing, jewellery, and shoes immediately. Wash with soap or mild detergent and large amount of water for at least 30 minutes. Get medical attention, if needed.
c. **EYE CONTACT:**
   **SHORT TERM EXPOSURE:** irritation (possible severe).
   **LONG TERM EXPOSURE:** same as effects reported in short term exposure.  
   Wash eyes immediately with large amounts of water or normal saline for at least 30 minutes, occasionally
   lifting upper and lower lids. Get medical attention immediately.

d. **INGESTION:**
   **SHORT TERM EXPOSURE:** burns, rash, nausea, diarrhoea, stomach pain, difficulty breathing, irregular
   heartbeat, headache, tingling sensation, visual disturbances, dilated pupils, bluish skin colour, paralysis,
   convulsions, coma.
   **LONG TERM EXPOSURE:** no information on significant adverse effects.
   If vomiting occurs, keep head lower than hips to help prevent aspiration. Get medical attention, if needed.

e. **CARCINOGEN STATUS:**
   OSHA: N   NTP: N   IARC: N

5. **FIRE-FIGHTING MEASURES**

   **FIRE AND EXPLOSION HAZARD:**
   Non-flammable. Negligible fire hazard. May ignite or explode on contact with combustible materials.
   Hydrogen fluoride gas can be produced during a fire.

   **EXTINGUISHING MEDIA**
   XeF2 is non-flammable and extinguishing media should be based on surrounding material. Do not use dry
   chemical, carbon dioxide or halogenated extinguishing agents. Large fires, flood with water. Apply water
   from a protected location or from a safe distance.

   **FIREFIGHTING**
   Move container from fire area if it can be done without risk. Cool containers with water spray until well
   after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers
   with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible
   then take the following precautions:

   Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Flood with water.
   Cool containers with water spray until well after the fire is out. Apply water from a protected location or
   from a safe distance. Avoid inhalation of material or combustion by-products. Evacuate if fire gets out of
   control or containers are directly exposed to fire. Evacuation radius: 800 meters (1/2 mile).

   **SPECIAL PROTECTIVE EQUIPMENT:**
   In case of fire, wear a self-contained breathing apparatus and full protective equipment.

6. **ACCIDENTAL RELEASE MEASURES**

   For protective equipment required please refer to section 8.

   **OCCUPATIONAL SPILL:**
   Avoid contact with combustible materials. Do not touch spilled material. Small dry spills: Move
   containers away from spill to a safe area. Small liquid spills: Absorb with sand or other non-combustible
   material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal.
   Keep unnecessary people away, isolate hazard area and deny entry.
ENVIRONMENTAL PRECAUTIONS:
Prevent product from entering sewer system.

7. HANDLING AND STORAGE

Store and handle in accordance with all current regulations and standards. NFPA 430 Code for the Storage of Liquid and Solid Oxidizing Materials. Store under a dry inert atmosphere. Store in a tightly closed container. Avoid contact with water or moisture. Keep separated from incompatible substances. Ensure good ventilation at the workplace.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

EXPOSURE LIMITS:

XeF₂:
INORGANIC FLUORIDES (as F): 2.5 mg/m³ OSHA TWA 2.5 mg/m³ ACGIH TWA 2.5 mg/m³ NIOSH recommended TWA 10 hour(s) 2.5 mg(F)/m³ UK OES TWA MEASUREMENT METHOD: Treated pad with pre-filter (with special coating); Reagent; Ion-specific electrode; NIOSH III # 7902, Fluorides.

VENTILATION:
Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION:
Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING:
Wear appropriate chemical resistant clothing.

GLOVES:
Wear appropriate chemical resistant gloves.

RESPIRATOR:
The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
Measurement Element: F

12.5 mg/m³ Any dust and mist respirator.
25 mg/m³ Any dust and mist respirator. Any supplied-air respirator.
62.5 mg/m³ Any supplied air respirator. Any powered, air-purifying respirator with a dust and mist filter. May need acid gas sorbent.

125 mg/m³ Any air-purifying respirator with full-face piece and a high-efficiency particulate filter. May need acid gas sorbent. Any self-contained breathing apparatus with a full-face piece.

250 mg/m³ Any supplied-air respirator with a full face piece that is operator in a pressure-demand or other positive-pressure mode.

Escape – Any air-purifying respirator with a full-face piece and a high-efficiency particulate filter. May need acid gas sorbent. Any appropriate escape-type, self-contained breathing apparatus.
For unknown concentrations or Immediately Dangerous to Life or Health – Any supplied-air respirator with full face piece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full-face piece.

HYGIENE MEASURES:
Immediately change contaminated clothing. Wash hands and face after working with substance. Do not eat or drink at workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>Form</td>
<td>Solid; crystals</td>
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<tr>
<td>Molecular formula</td>
<td>Xe – F2</td>
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<tr>
<td>Colour</td>
<td>Colourless to white</td>
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<tr>
<td>Molecular weight</td>
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<tr>
<td>Vapour pressure</td>
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<td>Melting point</td>
<td>264-284 F (129-140 C)</td>
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<tr>
<td>Specific gravity</td>
<td>3.13-4.32</td>
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<tr>
<td>Sublimation PT</td>
<td>237 F (114 C)</td>
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<tr>
<td>Vapour density</td>
<td>&gt;1</td>
</tr>
</tbody>
</table>

Water solubility:
Reacts to form hydrogen fluoride

10. STABILITY AND REACTIVITY

REACTIVITY:
Contact with water or moist air will form HF and/or toxic gases or vapours.

CONDITIONS TO AVOID:
Avoid contact with combustible materials. May ignite or explode on contact with combustible materials. Keep out of water supplies and sewers.

INCOMPATIBILITIES:
Combustible materials, oxidizing materials, reducing agents.

XeF2:
ACETONE: May cause an explosion on contact.
DIMETHYLAMINOTRIMETHYLSILANE: In presence or absence of solvent may be explosive at sub-zero temperature.
DIMETHYL-SULFIDE: Interaction in absence of solvent is explosive at ambient temperature.
ETHANOL: May cause vigorous reactions.
LUBRICANTS: May cause an explosion on contact.
OTHER COMBUSTIBLES: May cause an explosion on contact.
PAPER: May cause an explosion on contact.
PENTACARBONYLIRON: May cause an explosion on contact.
POLYETHYLENE: May cause an explosion on contact.
POTASSIUM IODATE: May cause vigorous reactions.
POTASSIUMPERMANGANATE: May cause vigorous reactions.
SAWDUST: May cause an explosion on contact.
SILICON + NITROGEN COMPOUND: In presence or absence of solvent may be explosive at sub-zero temperatures.
STYRENE: May cause an explosion on contact.
WOOL: May cause an explosion on contact.

OXIDIZERS:
COMBUSTIBLE MATERIALS: May increase the burning rate or cause ignition on contact; finely divided materials may result in an explosion.
ORGANIC MATERIALS: May increase the burning rate or cause ignition on contact; finely divided materials may result in an explosion.
REDUCING MATERIALS: Fire and explosion hazard.

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: halogens. Contact with moisture will yield hydrogen fluoride.

POLYMERIZATION:
Will not polymerise.

11. TOXICOLOGICAL INFORMATION

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:
Central nervous system disorder, bone, joint or tooth disorders, eye disorders, kidney disorder, respiratory disorders, skin disorders and allergies.

ADDITIONAL DATA:
May cross the placenta. May be excreted in breast milk.

12. ECOLOGICAL INFORMATION:

MOBILITY: No data available.

PERSISTENCE/DEGRADABILITY: No data available.

BIOACCUMULATION: No data available.

ECOTOXICITY: No data available.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D003.

14. TRANSPORT INFORMATION

APPLICABLE REGULATIONS:
Refer to country of destination.

SAFETY AND RISK PHRASES:
U.S. DOT 49 CFR 172.101 SHIPPING NAME-UN NUMBER: Oxidizing solid, n.o.s. (xenon difluoride) UN1479

U.S. DOT 49 CFR 172.101 HAZARD CLASS OR DIVISION: 5.1

U.S. DOT 49 CFR 172.101 PACKING GROUP: II

U.S. DOT 49 CFR 172.101 AND SUBPART E LABELING REQUIREMENTS: Oxidizer

U.S. DOT 49 CFR 172.101 PACKAGING AUTHORIZATIONS:

EXCEPTIONS:
49 CFR 173.152

NON-BULK PACKAGING:
49 CFR 173.212

BULK PACKAGING:
49 CFR 173.240

U.S. DOT 49 CFR 172,101 QUANTITY LIMITATIONS:

PASSENGER AIRCRAFT OR RAILCAR:
5 kg

CARGO AIRCRAFT ONLY:
25 kg

LAND TRANSPORT ADR/RID:
SUBSTANCE NAME:
Oxidizing solid, n.o.s. UN NUMBER :UN1479 ADR/RID CLASS: 5.1 ITEM NUMBER: 27(b)
WARNING SIGN/LABEL: 5.1 HAZARD ID NUMBER: 50

AIR TRANSPORT IATA/ICAO:
CORRECT TECHNICAL NAME:
Oxidizing solid, n.o.s. UN/ID NUMBER: UN1479 IATA/ICAO CLASS: 5.1 PACKAGING GROUP: II
LABEL: Oxidizer

MARITIME TRANSPORT IMDG:
CORRECT TECHNICAL NAME: Oxidizing substances, solid, n.o.s. UN/ID NUMBER: UN1479 IMDG CLASS: 5.1 PACKAGING GROUP: II EmS No.: 5.1-11 MFAG Table No.: 760 MARINE POLLUTANT: Y

15. REGULATORY INFORMATION

APPLICABLE REGULATIONS:
Refer to country of destination.

SAFETY AND RISK PHRASES:
According to (National equivalent of EC-Dir.67/548), as amended, the product is labelled as follows:

♦ TSCA Status : Y
♦ TSCA 12(b) export notification : Not listed.
♦ CERCLA Section 103 (40 CFR 302.4) : N
♦ SARA Section 302 (40 CFR 355.30) : N TPQ
♦ SARA Section 304 (40 CFR 355.40) : N RQ
♦ SARA Section 313 (40 CFR 372.65) : N
♦ California Prop 65 Status : N
♦ SARA ACUTE Hazard : N
♦ SARA CHRONIC Hazard : N
♦ SARA FIRE Hazard : N
♦ SARA REACTIVITY Hazard : Y
♦ SARA SUDDEN RELEASE Hazard : N
♦ WHMIS Classification : N
♦ INTERNATIONAL REGULATIONS:

EU RISK AND SAFETY PHRASES: 8-23/24/25-34.
Contact with combustible material may cause fire. May cause harm to breastfed babies.

The safety phrases that would be appropriate are: 8-17-26-36/37-39

16. OTHER INFORMATION

No other information is currently available for this record.

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