1: Identification of substance / mixture

1. Product Identifier

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Hydrazine hydrate solution 35% in water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Code</td>
<td>044325</td>
</tr>
<tr>
<td>CAS Number</td>
<td>302-01-2</td>
</tr>
<tr>
<td>Other Names</td>
<td></td>
</tr>
<tr>
<td>IUPAC</td>
<td></td>
</tr>
<tr>
<td>MFCD Number</td>
<td>MFCD00149931</td>
</tr>
<tr>
<td>EC/EINECS</td>
<td>206-114-9</td>
</tr>
<tr>
<td>REACH Number</td>
<td></td>
</tr>
</tbody>
</table>

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

Research and Development

1. Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Hazard Statement</th>
<th>Precautionary Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>H301 Acute Tox. 3</td>
<td>R25</td>
</tr>
<tr>
<td>H314 Skin Corr. 1B</td>
<td>R34</td>
</tr>
<tr>
<td>H317 Skin Sens. 1</td>
<td>R43</td>
</tr>
<tr>
<td>H331 Acute Tox. 3</td>
<td>R23, R23</td>
</tr>
<tr>
<td>H350 Carc. 1B</td>
<td>R45, R49</td>
</tr>
<tr>
<td>H410 Aquatic Chronic 1</td>
<td></td>
</tr>
</tbody>
</table>

* The risk codes have been generated using Annex VII of directive 67/548/EEC. Risk code combinations are not included.

2. Label elements

Signal Word Danger

Hazard Statements

- H301 Toxic if swallowed.
- H314 Causes severe skin burns and eye damage.
- H317 May cause an allergic skin reaction.
- H331 Toxic if inhaled.
- H350 May cause cancer .
- H410 Very toxic to aquatic life with long lasting effects.

Precautionary Phrases

- P201 Obtain special instructions before use.
3. Other Hazards
Additional precautionary phrases are located throughout the safety data sheet

3. Composition / Information on Ingredients

1. Substances
Hydrazine hydrate solution 35% in water
Assay: 100% CAS Number: 302-01-2

2. Mixtures
Not Relevant

4. First Aid Measures

1. Description of first aid measures

<table>
<thead>
<tr>
<th>Event</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Contact</td>
<td>IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.</td>
</tr>
<tr>
<td>Eye Contact</td>
<td>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.</td>
</tr>
</tbody>
</table>

2. Most important symptoms and effects
There may be pain and redness.

3. Indication of any immediate medical attention
No additional measures required

5. Firefighting measures

1. Extinguishing Media

<table>
<thead>
<tr>
<th>Media</th>
<th>Suitable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carbon dioxide.</td>
</tr>
<tr>
<td></td>
<td>Dry chemical powder.</td>
</tr>
<tr>
<td></td>
<td>Alcohol or polymer foam.</td>
</tr>
<tr>
<td></td>
<td>Use water spray to cool containers.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Media</th>
<th>Unsuitable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no data</td>
</tr>
</tbody>
</table>

2. Special Hazards arising from the substance or mixture
In combustion emits toxic fumes of carbon dioxide / carbon monoxide.
In combustion emits toxic fumes of nitrogen oxides.
In combustion emits toxic fumes of hydrogen chloride / phosgene.
In combustion emits toxic fumes of hydrogen bromide.

3. Advice for Fire Fighters
### 6. Accidental Release Measures

#### 1. Personal Precautions

Do not attempt to take action without suitable protective clothing – see section 8 of SDS. Evacuate the area immediately.

#### 2. Environmental Precautions

Do not discharge into drains or rivers. Contain the spillage using bunding.

### 3. Methods & Materials

Mix with sand or vermiculite. Transfer to a closable, labelled salvage container for disposal by an appropriate method. Avoid all incompatible materials in clean-up procedure. See section 10 of SDS.

### 7. Handling and Storage

#### 1. Personal Precautions

**Safe Handling**
- Ensure there is sufficient ventilation of the area.
- Avoid release to the environment.
- Do not eat, drink or smoke when using this product.
- Obtain special instructions before use. <Manufacturer/supplier to specify applicable ignition source(s).>
- Wash handsougly after handling.

**Protection against explosions and fires**
- Wash contaminated clothing before reuse.
- Normal measures for preventive fire protection

#### 2. Conditions for safe storage, including any incompatibilities

**Managing Storage Risks**
- Store in cool, well ventilated area.
- Keep container tightly closed.
- Keep away from direct sunlight.

**Storage Controls**
- No special requirements

**Maintaining Integrity**
- Store away from oxidising agents
- Keep in tightly closed container in cool area away from direct sunlight or heat sources.

**Other advice**
- No further information available

### 3. Specific End Uses

The end use(s) have not been fully determined. The substance is supplied for Research and Development purposes by professionals only.

### 8. Exposure Controls/Personal Protection

#### 1. Control Parameters

No Data Available
2. Exposure Controls

General protective and hygiene measures
- Wear protective gloves/protective clothing/eye protection/face protection. Wash hands during breaks and at the end of handling the material. Immediately remove any contaminated clothing.

Engineering measures
- Ensure there is sufficient ventilation of the area.

Eye / Face Protection
- Safety Glasses with side-shields.

Hand protection
- Protective gloves.

Respiratory protection
- Do not breathe dust/fume/gas/mist/vapours/spray. Use breathing protection with high concentrations.

Skin protection
- Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Wash and dry hands. Protective clothing.

Other personal protection advice
- No data

9. Physical and Chemical Properties

1. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear colourless liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>PH</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Melting point / Freezing point</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Flammability(solid,gas)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>99.99 % (V) / 3.5 % (V)</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>7 hPa at 25 °C</td>
</tr>
<tr>
<td>Vapour density</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.011 g/cm³ at 25 °C</td>
</tr>
<tr>
<td>Solubility(ies):</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

2. Other Information
- No additional information available

10. Stability and Reactivity

1. Reactivity
2. Stability
Stable under normal conditions.

3. Possibility of Hazardous Reactions
no hazardous reactions known

4. Conditions to Avoid
no specific conditions to avoid

5. Incompatible Materials
Oxidising agents.
Acids.
Zinc.
Organic materials,
Oxygen,
Copper

6. Hazardous Decomposition Products
In combustion emits toxic fumes of carbon dioxide / carbon monoxide.

11. Toxicology information

1. Information

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity</td>
<td>no data</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>caustic for skin and mucous membranes</td>
</tr>
<tr>
<td>Serious eye Damage/irritation</td>
<td>strong caustic effect.</td>
</tr>
<tr>
<td>Respiratory or skin sensitisation</td>
<td>No sensitizing effect known</td>
</tr>
<tr>
<td>Germ Cell mutagenicity</td>
<td>not known</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>2B - Group 2B: Possibly carcinogenic to humans (Hydrazine)</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>not known</td>
</tr>
<tr>
<td>STOT-single exposure</td>
<td>not known</td>
</tr>
<tr>
<td>STOT-repeated exposure</td>
<td>not known</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>not known</td>
</tr>
</tbody>
</table>

2. Additional
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC,NTP,OSHA or ACGIH
swallowing will lead to a strong caustic effect on mouth and throat and the danger of perforation of oesophagus and stomach.

12. Ecological Information

1. Toxicity
not known
2. Persistence and degradability
   not known

3. Bio-Accumulative Potential
   not known

4. Mobility and Soil
   not known

5. Results of PBT & vPvB assessment
   not known

6. Other adverse effects
   Do not allow product to reach ground water, water bodies or sewage system, even in small quantities.

13. Disposal Considerations

   1. Waste Treatment Methods
      Disposal Operations
      Disposal of Packaging   Disposal must be made according to official regulations.

14. Transport Information

   Air (ICAO)
   1. UN Number: 3293
   2. UN proper shipping name: Hydrazine, aqueous solution with 37% or less hydrazine, by weight
   3. Transport hazard class(es): Class: 6.1   Sub Class :
     ![Chemical Symbol]
   4. Packing group: III
   5. Environmental hazards:
   6. Special Precautions for user:
   7. Transport in bulk:

   Road (ADR)
   1. UN Number: 3293
   2. UN proper shipping name: HYDRAZINE, AQUEOUS SOLUTION with not more than 37% hydrazine, by mass
   3. Transport hazard class(es): Class: 6.1   Sub Class :
     ![Chemical Symbol]
   4. Packing group: III
   5. Environmental hazards:
   6. Special Precautions for user:
   7. Transport in bulk:

   Sea (IMDG)
1. Safety, health and environmental regulations:
   product is not subject to any additional regulations or provisions

2. Safety Assessment
   No Chemical Safety Assessment

16. Other Information

1. Other Information:
   ADR: Accord Europeen sur le transport des marchandises Dangereuses par Route (European Agreement concerning the
   International Carriage of Dangerous Goods by road)
   RID: Reglement International concernant le transport des marchandises dangereuses par chemin de fer (Regulations concerning the
   International transport of Dangerous Goods by Rail)
   IMDG: International Maritime Code for Dangerous Goods
   IATA: International Air Transport Association
   IATA-DGR: Dangerous Goods Regulations by the International Air Transport Association
   ICAO: International Civil Aviation Organization
   ICAO-TI: Technical Instructions by the ICAO
   GHS: Globally Harmonized System of Classification and Labelling of Chemicals
   CAS: Chemical Abstracts Service

2. Associated risk phrases according to european directive 67/548/EEC

<table>
<thead>
<tr>
<th>Risk Phrase</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R23</td>
<td>Toxic by inhalation.</td>
</tr>
<tr>
<td>R25</td>
<td>Toxic if swallowed.</td>
</tr>
<tr>
<td>R34</td>
<td>Causes burns.</td>
</tr>
<tr>
<td>R43</td>
<td>May cause sensitisation by skin contact.</td>
</tr>
<tr>
<td>R45</td>
<td>May cause cancer.</td>
</tr>
<tr>
<td>R49</td>
<td>May cause cancer by inhalation.</td>
</tr>
</tbody>
</table>

3. Disclaimer

The product listed is for research and development purposes only and not for human or animal use. As such, in most cases, the
 toxicological, ecological and physicochemical properties have not been fully determined and the product should be treated with respect and always handled under suitable conditions by appropriately qualified personnel. The responsible party shall use this datasheet only in conjunction with other sources of information gathered by them, and should make an independent judgement of suitability, 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.