

## PHENYLHYDRAZINE HYDROCHLORIDE

GHS Safety Data Sheet

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### Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

#### PRODUCT NAME

PHENYLHYDRAZINE HYDROCHLORIDE

#### OTHER NAMES

C6-H9-Cl-N2, C6H5NHNH2.HCl, "hydrazine, phenyl-, monohydrochloride", "phenylhydrazine monohydrochloride", "phenylhydrazinium chloride"

#### PROPER SHIPPING NAME

TOXIC SOLID, ORGANIC, N.O.S.(contains phenylhydrazine hydrochloride)

#### PRODUCT USE

■ Reducing agent.

Used therapeutically as a haemolytic.

Intermediate

#### SUPPLIER

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### Section 2 - HAZARDS IDENTIFICATION

#### GHS Classification

Acute Aquatic Hazard Category 1

Acute Toxicity Category 3

Acute Toxicity Category 3

Acute Toxicity Category 3

Carcinogen Category 1B

Eye Irritation Category 2A

Germ Cell Mutagen Category 2

Skin Corrosion/Irritation Category 2

Skin Sensitizer Category 1

STOT - RE Category 1



#### EMERGENCY OVERVIEW

#### HAZARD

DANGER

Determined by using GHS criteria

continued...

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## Section 2 - HAZARDS IDENTIFICATION

|      |                                                                 |
|------|-----------------------------------------------------------------|
| H301 | Toxic if swallowed.                                             |
| H311 | Toxic in contact with skin.                                     |
| H315 | Causes skin irritation.                                         |
| H317 | May cause an allergic skin reaction.                            |
| H319 | Causes serious eye irritation.                                  |
| H331 | Toxic if inhaled.                                               |
| H341 | Suspected of causing genetic defects.                           |
| H350 | May cause cancer.                                               |
| H372 | Causes damage to organs through prolonged or repeated exposure. |
| H400 | Very toxic to aquatic life.                                     |

## PRECAUTIONARY STATEMENTS

### Prevention

| Code | Phrase                                                                     |
|------|----------------------------------------------------------------------------|
| P201 | Obtain special instructions before use.                                    |
| P202 | Do not handle until all safety precautions have been read and understood.  |
| P260 | Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.                      |
| P261 | Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.                     |
| P264 | Wash ... thoroughly after handling.                                        |
| P270 | Do not eat, drink or smoke when using this product.                        |
| P271 | Use only outdoors or in a well- ventilated area.                           |
| P272 | Contaminated work clothing should not be allowed out of the workplace.     |
| P273 | Avoid release to the environment.                                          |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P281 | Use personal protective equipment as required.                             |

### Response

| Code           | Phrase                                                                                                                           |
|----------------|----------------------------------------------------------------------------------------------------------------------------------|
| P301+P310      | IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.                                                              |
| P302+P352      | IF ON SKIN: Wash with plenty of soap and water.                                                                                  |
| P304+P340      | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.                                 |
| P305+P351+P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P308+P313      | IF exposed or concerned: Get medical advice/attention.                                                                           |
| P311           | Call a POISON CENTER or doctor/physician.                                                                                        |
| P312           | Call a POISON CENTER or doctor/physician if you feel unwell.                                                                     |
| P314           | Get medical advice/attention if you feel unwell.                                                                                 |
| P330           | Rinse mouth.                                                                                                                     |
| P332+P313      | If skin irritation occurs: Get medical advice/attention.                                                                         |
| P333+P313      | If skin irritation or rash occurs: Get medical advice/attention.                                                                 |
| P337+P313      | If eye irritation persists: Get medical advice/attention.                                                                        |
| P361           | Remove/Take off immediately all contaminated clothing.                                                                           |
| P362           | Take off contaminated clothing and wash before re- use.                                                                          |
| P363           | Wash contaminated clothing before reuse.                                                                                         |
| P391           | Collect spillage.                                                                                                                |

### Storage

| Code      | Phrase                                                            |
|-----------|-------------------------------------------------------------------|
| P403+P233 | Store in a well- ventilated place. Keep container tightly closed. |
| P405      | Store locked up.                                                  |

### Disposal

| Code | Phrase                               |
|------|--------------------------------------|
| P501 | Dispose of contents/container to ... |

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME                          | CAS RN  | %   |
|-------------------------------|---------|-----|
| phenylhydrazine hydrochloride | 59-88-1 | >98 |

continued...

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## Section 4 - FIRST AID MEASURES

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### SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.

### EYE

- If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.

### SKIN

- If skin or hair contact occurs:
- Quickly but gently, wipe material off skin with a dry, clean cloth.
- Immediately remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

### NOTES TO PHYSICIAN

- In poisonings involving hydrazine:  
Correction of early hypoglycaemia, with large parenteral doses of pyridoxine appears to suppress convulsions and other neurological effects.  
In man, hydrazine-induced hyperexcitability and coma may respond to massive doses of pyridoxine but there is no evidence that liver necrosis or damage can be prevented or corrected by this antidote.  
GOSSELIN, SMITH & HODGE: Clinical Toxicology of Commercial Products, 5 th Ed.  
The material may induce methaemoglobinaemia following exposure.
- Initial attention should be directed at oxygen delivery and assisted ventilation if necessary. Hyperbaric oxygen has not demonstrated substantial benefits.
- Hypotension should respond to Trendelenburg's position and intravenous fluids; otherwise dopamine may be needed.
- Symptomatic patients with methaemoglobin levels over 30% should receive methylene blue. (Cyanosis, alone, is not an indication for treatment). The usual dose is 1-2 mg/kg of a 1% solution (10 mg/ml) IV over 50 minutes; repeat, using the same dose, if symptoms of hypoxia fail to subside within 1 hour.
- Thorough cleansing of the entire contaminated area of the body, including the scalp and nails, is of utmost importance.

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## Section 5 - FIRE FIGHTING MEASURES

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### EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).

### FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.

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## Section 5 - FIRE FIGHTING MEASURES

### FIRE/EXPLOSION HAZARD

- Combustible solid which burns but propagates flame with difficulty; it is estimated that most organic dusts are combustible (circa 70%) - according to the circumstances under which the combustion process occurs, such materials may cause fires and / or dust explosions.
- Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions).
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust (420 micron or less) may burn rapidly and fiercely if ignited - particles exceeding this limit will generally not form flammable dust clouds; once initiated, however, larger particles up to 1400 microns diameter will contribute to the propagation of an explosion.
- In the same way as gases and vapours, dusts in the form of a cloud are only ignitable over a range of concentrations; in principle, the concepts of lower explosive limit (LEL) and upper explosive limit (UEL) are applicable to dust clouds but only the LEL is of practical use; - this is because of the inherent difficulty of achieving homogeneous dust clouds at high temperatures (for dusts the LEL is often called the "Minimum Explosible Concentration", MEC).

Combustion products include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), hydrogen chloride, phosgene, nitrogen oxides (NO<sub>x</sub>), other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

### FIRE INCOMPATIBILITY

- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

## Section 6 - ACCIDENTAL RELEASE MEASURES

### MINOR SPILLS

- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by all means available, spillage from entering drains or water courses.

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

## Section 7 - HANDLING AND STORAGE

### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions)
- Minimise airborne dust and eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, and flame.
- Establish good housekeeping practices.
- Remove dust accumulations on a regular basis by vacuuming or gentle sweeping to avoid creating dust clouds.

### PACKAGING MATERIAL INCOMPATIBILITIES

|               |                                              |
|---------------|----------------------------------------------|
| Chemical Name | Container Type                               |
|               | " Acetal (Delrin)" , " Cast iron" , Neoprene |

### SUITABLE CONTAINER

- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.

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## Section 7 - HANDLING AND STORAGE

- Packing as recommended by manufacturer.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure. <</>.

### STORAGE INCOMPATIBILITY

- Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.

Phenylhydrazine

- is a highly reactive reducing agent
- reacts violently with oxidisers, calcium hypochlorite, fluorine, hydrogen peroxide and perchlorates, methyl iodide, 2-phenylamino-3-phenyloxazirane, 3-(3-cyano-1,2,4-oxadiazol-5-yl)-4-cyanofurazan-2(5)-oxide, dicyanofurazan, dicyanofurazan-n-oxide, lead dioxide
- mixtures with perchloryl fluoride forms explosive materials
- is incompatible with oxides of iron, copper, manganese, and their alloys, sodium dichlorocyanurate, and many organic compounds.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

Air and light sensitive.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

- phenylhydrazine hydrochloride:

CAS:59- 88- 1 CAS:27140- 08- 5

### MATERIAL DATA

PHENYLHYDRAZINE HYDROCHLORIDE:

- for phenylhydrazine

The recommended TLV-TWA has been established because toxic effects produced by phenylhydrazine are similar to those of monomethylhydrazine and because of the demonstrated potential for carcinogenicity after oral or parenteral administration to rodents. Exposure at or below the TLV-TWA is thought to reduce the risks of acute blood-related toxicity and possible cancer. Exposure limits with "skin" notation indicate that vapour and liquid may be absorbed through intact skin. Absorption by skin may readily exceed vapour inhalation exposure. Symptoms for skin absorption are the same as for inhalation. Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard.

CEL TWA: 0.1 ppm, 0.44 mg/m3 (skin) (compare TLV TWA: phenylhydrazine)

■ NOTE E: Substances with specific effects on human health that are classified as carcinogenic, mutagenic and/ or toxic for reproduction in categories 1 or 2 are ascribed Note E if they are classified as very toxic (T+), toxic (T) or harmful (Xn). For these substances the risk phrases R20 ,R21, R22, R23, R24,R25, R26, R27, R28, R39, R68, R48 and R65 and all combinations of these risk phrases shall be preceded by the word "Also".

R45-23: May cause cancer. Also toxic by inhalation

This note applies only to certain complex oil-derived substances in Annex I.

### PERSONAL PROTECTION



### RESPIRATOR

- Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

### EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document,

continued...

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### Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].

#### HANDS/FEET

- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber.

#### NOTE:

- The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

#### OTHER

- Employees working with confirmed human carcinogens should be provided with, and be required to wear, clean, full body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers and gloves prior to entering the regulated area. [AS/NZS ISO 6529:2006 or national equivalent]
- Employees engaged in handling operations involving carcinogens should be provided with, and required to wear and use half-face filter-type respirators with filters for dusts, mists and fumes, or air purifying canisters or cartridges. A respirator affording higher levels of protection may be substituted. [AS/NZS 1715 or national equivalent]
- Emergency deluge showers and eyewash fountains, supplied with potable water, should be located near, within sight of, and on the same level with locations where direct exposure is likely.
- Prior to each exit from an area containing confirmed human carcinogens, employees should be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers must be identified with suitable labels. For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood.
- Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.

#### ENGINEERING CONTROLS

■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

### Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

#### APPEARANCE

Whiteto cream crystalline powder.

#### PHYSICAL PROPERTIES

Solid.

Mixes with water.

|                         |                   |                           |                |
|-------------------------|-------------------|---------------------------|----------------|
| State                   | Divided solid     | Molecular Weight          | 144.61         |
| Melting Range (°C)      | 250- 254 (decomp) | Viscosity                 | Not Applicable |
| Boiling Range (°C)      | Not available     | Solubility in water (g/L) | Miscible       |
| Flash Point (°C)        | Not available     | pH (1% solution)          | Not available. |
| Decomposition Temp (°C) | 250               | pH (as supplied)          | Not applicable |

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# PHENYLHYDRAZINE HYDROCHLORIDE

Chemwatch GHS Safety Data Sheet

Issue Date: 3-Apr-2009

C636SP

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## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

|                           |                |                                 |                |
|---------------------------|----------------|---------------------------------|----------------|
| Autoignition Temp (°C)    | Not available. | Vapour Pressure (kPa)           | Negligible     |
| Upper Explosive Limit (%) | Not available. | Specific Gravity (water=1)      | Not available  |
| Lower Explosive Limit (%) | Not available. | Relative Vapour Density (air=1) | >1             |
| Volatile Component (%vol) | Negligible     | Evaporation Rate                | Not applicable |

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

*For incompatible materials - refer to Section 7 - Handling and Storage.*

## Section 11 - TOXICOLOGICAL INFORMATION

### Health hazard summary table:

|                                   |                                                                      |
|-----------------------------------|----------------------------------------------------------------------|
| Acute toxicity                    | Acute Tox. (dermal) 3<br>Acute Tox. (inhal) 3<br>Acute Tox. (oral) 3 |
| Skin corrosion/irritation         | Skin Irrit. 2                                                        |
| Serious eye damage/irritation     | Eye Irrit. 2A                                                        |
| Respiratory or skin sensitization | Skin Sens. 1                                                         |
| Germ cell mutagenicity            | Muta. 2                                                              |
| Carcinogenicity                   | Carc. 1B                                                             |
| Reproductive toxicity             | Not applicable                                                       |
| STOT- single exposure             | Not applicable                                                       |
| STOT- repeated exposure           | STOT RE 1                                                            |
| Aspiration hazard                 | Not applicable                                                       |

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

- Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.
- Strong evidence exists that this substance may cause irreversible mutations (though not lethal) even following a single exposure.
- The substance and/or its metabolites may bind to haemoglobin inhibiting normal uptake of oxygen. This condition, known as "methaemoglobinemia", is a form of oxygen starvation (anoxia).
- In animals, hydrazine and its derivatives cause convulsions, nervous system changes, muscle spasms and seizures, fever, and other symptoms, and in severe cases, causes failure of breathing and death.
- Phenylhydrazine may cause jaundice, loss of appetite, nausea, skin inflammation and blood clots.
- Hydrazine derivatives tend to be local irritants and cause convulsions, liver damage, and destruction of red blood cells. They also damage the kidneys, and cause stimulation of the central nervous system with tremors and convulsions, progressing to depression, respiratory collapse and death.

##### EYE

- This material can cause eye irritation and damage in some persons.

##### SKIN

- Skin contact with the material may produce toxic effects; systemic effects may result following absorption.
  - This material can cause inflammation of the skin on contact in some persons.
  - The material may accentuate any pre-existing dermatitis condition.
  - Many cases of contact dermatitis have been reported in industrial employees, laboratory workers and patients following exposure to phenylhydrazine.
- Phenylhydrazine is a strong skin sensitiser which produces an eczema-like skin inflammation with redness, swelling and blisters in many people.
- Open cuts, abraded or irritated skin should not be exposed to this material.
  - Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

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### Section 11 - TOXICOLOGICAL INFORMATION

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#### INHALED

- Inhalation of dusts, generated by the material, during the course of normal handling, may produce toxic effects.
  - The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of dusts, or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
  - Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
- If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.
- Symptoms of inhalation of hydrazine (and some of its derivatives) may include nausea and headache.
- Central nervous system (CNS) excitement may lead to convulsions, and, in severe cases, breathing stoppage and death.
- Animal testing shows that inhalation of phenylhydrazine can cause low blood pressure, stoppage of breathing and change in blood pigment.

#### CHRONIC HEALTH EFFECTS

- Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.
- There is ample evidence that this material can be regarded as being able to cause cancer in humans based on experiments and other information.
- Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
- This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. This has been demonstrated via both short- and long-term experimentation.
- Laboratory (in vitro) and animal studies show, exposure to the material may result in a possible risk of irreversible effects, with the possibility of producing mutation.
- Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.
- There is some evidence that inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.
- When given by mouth, hydrazine induced tumours in animal testing. A study of 423 men involved in the manufacture of hydrazine revealed three stomach, one prostate and one neurogenic cancer.
- Long term exposure to phenylhydrazine can cause damage to the liver, lungs and kidneys. There may be destruction of red blood cells with anaemia. There is also an increase in incidence of tumours of the lungs and blood vessels.
- Phenylhydrazines are capable of causing blood cell breakdown.
- Oxygen activation and generation of a superoxide occurs in body metabolic reactions. However, when their rate of formation exceed the capacity of the body's defence mechanisms, it results in "oxidative stress" which is involved in some biological processes such as aging and inflammation reactions and in the pathogenesis of several diseases, including acute pancreatitis, post-ischaemic syndrome, tumour formation, hardening of the arteries, and diabetic angiopathy.
- Free radicals can readily react and damage cell membranes and genetic materials, sulphur containing amino acids, complex sugars and glycogen. It may induce allergic reaction and even cell death. Gene modification may result in tumour formation.

#### TOXICITY AND IRRITATION

- The following information refers to contact allergens as a group and may not be specific to this product.
- Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

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### Section 12 - ECOLOGICAL INFORMATION

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Very toxic to aquatic organisms.  
This material and its container must be disposed of as hazardous waste.  
Avoid release to the environment.  
Refer to special instructions/ safety data sheets.

#### Ecotoxicity

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### Section 12 - ECOLOGICAL INFORMATION

| Ingredient                    | Persistence:<br>Water/Soil | Persistence: Air     | Bioaccumulation | Mobility |
|-------------------------------|----------------------------|----------------------|-----------------|----------|
| phenylhydrazine hydrochloride | HIGH                       | No Data<br>Available | LOW             | HIGH     |

### Section 13 - DISPOSAL CONSIDERATIONS

- Containers may still present a chemical hazard/ danger when empty.
  - Return to supplier for reuse/ recycling if possible.
- Otherwise:
- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
  - Where possible retain label warnings and MSDS and observe all notices pertaining to the product.
- Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.
- A Hierarchy of Controls seems to be common - the user should investigate:
- Reduction.
  - DO NOT allow wash water from cleaning or process equipment to enter drains.
  - It may be necessary to collect all wash water for treatment before disposal.
  - In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
  - Where in doubt contact the responsible authority.
  - Recycle wherever possible.
  - Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
  - Dispose of by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)
  - Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

### Section 14 - TRANSPORTATION INFORMATION



Labels Required: TOXIC

#### HAZCHEM: 2X

#### Land Transport UNDG:

|                                                                                      |      |                   |      |
|--------------------------------------------------------------------------------------|------|-------------------|------|
| Class or division:                                                                   | 6.1  | Subsidiary risk:  | None |
| UN No.:                                                                              | 2811 | UN packing group: | III  |
| Shipping Name: TOXIC SOLID, ORGANIC, N.O.S. (contains phenylhydrazine hydrochloride) |      |                   |      |

#### Air Transport IATA:

|                     |      |                    |      |
|---------------------|------|--------------------|------|
| ICAO/IATA Class:    | 6.1  | ICAO/IATA Subrisk: | None |
| UN/ID Number:       | 2811 | Packing Group:     | III  |
| Special provisions: | A3   |                    |      |

Shipping name: TOXIC SOLID, ORGANIC, N.O.S. (contains phenylhydrazine hydrochloride)

#### Maritime Transport IMDG:

|                                                                                      |            |                     |         |
|--------------------------------------------------------------------------------------|------------|---------------------|---------|
| IMDG Class:                                                                          | 6.1        | IMDG Subrisk:       | None    |
| UN Number:                                                                           | 2811       | Packing Group:      | III     |
| EMS Number:                                                                          | F- A, S- A | Special provisions: | 223 274 |
| Limited Quantities:                                                                  | 5 kg       | Marine Pollutant:   | Yes     |
| Shipping name: TOXIC SOLID, ORGANIC, N.O.S. (contains phenylhydrazine hydrochloride) |            |                     |         |

continued...

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**Section 15 - REGULATORY INFORMATION**

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**REGULATIONS**

**phenylhydrazine hydrochloride (CAS: 59-88-1,27140-08-5) is found on the following regulatory lists;**

"FisherTransport Information","India Manufacture, Storage and Import of Hazardous Chemical Rules - Schedule 1: List of Hazardous and Toxic Chemicals","International Chemical Secretariat (ChemSec) SIN List (\*Substitute It Now!)","Sigma-AldrichTransport Information","WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established"

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**Section 16 - OTHER INFORMATION**

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**INGREDIENTS WITH MULTIPLE CAS NUMBERS**

| Ingredient Name               | CAS                     |
|-------------------------------|-------------------------|
| phenylhydrazine hydrochloride | 59- 88- 1, 27140- 08- 5 |

- Classification of the preparation and its individual components has drawn on official and authoritative sources using available literature references.
- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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