Hazardous Substances Policy - Control Measures

Enhanced Good Chemical Practice for Work with Phenol

Introduction

Phenol is a crystalline solid with a characteristic carbolic smell. It is very corrosive - though pain is not immediate. Phenol is readily absorbed through the skin and can cause circulatory and respiratory failure which may lead to death. Phenol is often used in aqueous or organic solvent solutions which enhance its rate of skin absorption. Aqueous solutions as dilute as 10% may be corrosive. A technical assistant died 10 min after being sprayed with liquid phenol over approx. 25% of his body.

Requirements for Work with Phenol

1. Phenol must be kept in a locked cupboard and access restricted to authorised persons only.

2. An entry must be made in the register held in the cupboard to record the removal and return of phenol, and including the amount(s) involved, the date, and the signatures of the "Issuer" and the "User" and confirmation that a COSHH assessment has been done.

3. Work which is liable to lead to the release of airborne phenol must be performed in a fume cupboard.

4. The following personal protective equipment must be worn:
   - A laboratory coat, to keep personal clothing free from contamination;
   - Eye protectors.
   - Protective gloves (known to be impervious to the phenol and any solvent used) to prevent skin contact when handling phenol and its solutions or when articles contaminated with phenol are being handled.

   Further personal protective equipment may be necessary according to the nature and the degree of risk.

5. Protective clothing which has become contaminated with phenol must be decontaminated before normal laundering.

6. The phenol antidote and other appropriate emergency equipment listed below must be to hand wherever phenol is in use.

7. A copy of this policy must be displayed wherever phenol is in use.

Immediate first aid treatment

SPEED IS ESSENTIAL - DO NOT DELAY THE IMMEDIATE FIRST AID TREATMENT

Phenol in Contact with Skin:

1. Wear protective gloves and clothing as appropriate to avoid self-contamination.

2. Remove all contaminated clothing as rapidly as possible. If necessary cut the clothing to save time and reduce skin contamination. Do not pull contaminated clothing over the affected person's head. It is essential that contaminated clothing is removed in a way that avoids contamination of areas of the casualty's skin previously unaffected, especially the face and eyes.
3. Flush excess chemical off the skin with water.

4. Wash affected area with polyethylene glycol molecular weight 300 (Macrogol 300) for at least 30 minutes, changing the swabbing material frequently. Polyethylene glycol 300 may be used safely on skin surfaces, but contact with the eyes and mouth should be avoided.

5. After the affected area has been thoroughly washed keep the casualty warm and comfortable. Do not leave the casualty alone any longer than is necessary.

6. If the casualty is unconscious but is breathing, loosen clothing at the throat, remove any false teeth and lay the casualty in the recovery position.

7. If casualty has stopped breathing, start artificial respiration - NOT mouth to mouth - using oxygen and a suitable mechanical device such as a bag and mask.

8. Transport casualty to hospital.

**Phenol in Contact with Eyes:**

1. Flood the eye with water for at least ten minutes. It is important to ensure that the eye lid is fully opened.
2. Polyethylene glycol should not be used for treating eye splashes.
3. All eye injuries or splashes, however slight, should be referred to the Eye Hospital.

**Phenol Swallowed**

*Always take casualty to hospital, but do not delay the immediate first aid treatment.*

1. Rinse the casualty's mouth with water. Give no more than half a pint of milk to drink, if available, but no other fluids.
2. Do not induce vomiting.
3. Keep the casualty warm and at rest.
4. If the casualty is unconscious but is breathing, loosen clothing at the throat, remove any false teeth and lay the casualty in the recovery position.
5. If casualty has stopped breathing, start artificial respiration - NOT mouth to mouth - using oxygen and a suitable mechanical device such as a bag and mask.
6. Transport casualty to hospital.

**Phenol inhaled:**

1. Remove the casualty from exposure.
2. Keep the casualty warm and at rest.
3. If casualty has stopped breathing, start artificial respiration - NOT mouth to mouth - using oxygen and a suitable mechanical device such as a bag and mask.
4. Transport casualty to hospital.
Emergency Equipment

Emergency equipment

Showers or other suitable means for drenching affected areas with water. This should include eye wash facilities.

Phenol antidote

Adequate supplies of polyethylene glycol molecular weight 300 (Macrogol 300) with suitable swabbing materials, e.g., stockinette, muslin cloth or lint, for decontamination of affected parts. Large volumes of this reagent will be required if there is a foreseeable risk of extensive skin contamination.

Further Information and Guidance

Pure phenol exists as colourless deliquescent crystals with a characteristic carbolic smell. Commercial grades may have a pinkish coloration.

Hazards of Phenol

Eye Contact

Splashes in the eye cause very serious and probably irreversible damage to the cornea.

Skin Contact

Phenol is a powerful systemic poison and absorption through the skin occurs with great rapidity. Death has resulted from absorption of phenol when a skin area equivalent to the size of one hand has been contaminated.

Its appearance and characteristic carbolic smell do not give any warning of the highly corrosive effects of phenol on the skin which may result from seemingly trivial splashing or contamination of clothing.

In addition to its corrosive action phenol acts as a local anaesthetic and hence only a slight tingling of the contaminated skin may be felt before the onset of weakness, collapse and death.

Inhalation

Low concentrations (> 10ppm) of vapour cause irritation. However, the high concentrations which are assumed to be a serious respiratory hazard will only be encountered if phenol is heated or misted.

Ingestion

The possibility of ingesting phenol in the laboratory ought to be remote. Ingestion of phenol (drinking or swallowing) is usually rapidly fatal. The lowest reported lethal amount in adults is 140 mg kg\(^{-1}\)

Symptoms of Phenol Poisoning

Skin Contact

Severe burns will occur at the site of contact. These will be painless and are seen as an area of moist, white wrinkled skin. Some redness or yellow staining of the skin may occur. Phenol is absorbed through the skin and may cause symptoms similar to those of ingestion.
Schedule 3.6

Eye Contact
There will be severe pain and redness. Corneal burns can occur.

Ingestion
Nausea, vomiting and sweating with burns of the mouth, oesophagus and stomach are likely to occur. Blood may be vomited. The body temperature may rise and the pupils become dilated. Symptoms similar to those of inhalation may occur. Kidney failure is a possible complication.

Register
The following format should be used for the register.

<table>
<thead>
<tr>
<th>Date</th>
<th>Substance</th>
<th>COSHH assessment completed</th>
<th>Amount removed from cupboard</th>
<th>User's Signature</th>
<th>Issuer's Signature</th>
<th>Amount returned to cupboard</th>
<th>Issuer's Signature</th>
</tr>
</thead>
</table>

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