Information Sheet: Cyanides

Purpose
The purpose of this information sheet is to guide workers and supervisors in general precautions, storage and emergency responses for cyanides. The information should be read in conjunction with the Chemical Safety Management chapter of the HSW Handbook.

Q1 Are there any reference materials I should read before working with cyanides?
Please refer to the Guide for preventing and responding to cyanide poisoning in the workplace 2013. This guide includes information on the hazards of cyanides, routes of exposure, workplace exposure standards, biological monitoring for cyanides, controlling the risks, storage, disposal, responding in an emergency, first aid and cyanide emergency kit contents.

Q2 Why do cyanides warrant special care?
- Hydrogen cyanide gas and cyanide salts are among the most rapidly acting of all known poisons. Even small concentrations are extremely hazardous. Cyanide salts are odourless when dry and when damp they may have a slight odour of bitter almonds. A person’s sense of smell must not be relied on as a warning signal to detect it’s presence as the sense of smell easily fatigues and not everyone can smell it.
- Hydrogen cyanide gas is highly flammable and in liquid form is both highly volatile and flammable.
- Exposure of cyanides to strong oxidisers such as nitrates and chlorates may cause fires and explosions.

Onset of symptoms after exposure is very rapid (within a few minutes). Symptoms and signs of mild cyanide poisoning include headaches, giddiness, nausea and vomiting (if the cyanide has been ingested). The person has difficulty breathing, a sense of suffocation and a feeling of general weakness with heaviness of arms and legs. This may then be followed by seizures, loss of consciousness and cardiac arrest.

Q3 What should be considered before starting any experiment with cyanides?
- Refer to the Guide for preventing and responding to cyanide poisoning in the workplace 2013 and the Safety Data Sheet.
- Consider eliminating the use of cyanides.
- Complete a risk assessment, in accordance with the Hazard Management handbook chapter. (This includes sign off by a supervisor if completed by a HDR student.)
  - Complete a safe operating procedure (which includes emergency procedures and the distance to the nearest hospital);
  - Provide proficiency based instruction, that includes the location and provision of antidotes, prior to any work commencing.
  - (Note: Proficiency (for the purposes of the University), is the achievement of a level of demonstrable knowledge, ability or skill acquired through instruction, which enables the operator to complete a high risk activity safely and without supervision. The requirement for a level of proficiency is identified as a control measure on the Risk Assessment. This level of instruction is required prior to workers undertaking an activity and a record is required to be maintained on file and recorded on the Training Plan (equivalent). A proficiency may be mapped against a Safe Operating Procedure, or could be via a log book or series of supervised training sessions/courses.)
- Check facilities
  - Emergency showers and eye-wash facilities must be available within the immediate work area where cyanide compounds are handled.
  - Cyanides must not be used in an open laboratory. Work with cyanides must be contained in a fume cupboard with fully functional extraction rate (i.e. fully compliant cupboard).
  - Warning signs must be posted around the immediate work area.

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Q3 What should be considered before starting any experiment with cyanides? (Continued)

- Personal Protective Equipment
  - Wear impervious gloves (e.g. PVC) at all times when handling cyanides.
  - Wear a protective apron, rubber boots and face shield whenever there is the possibility of being splashed with a cyanide compound.
  - Handle gloves and other protective equipment carefully and safely.
  - Wash equipment immediately after use and store clean items well away from cyanides.
  - Use the appropriate respiratory equipment for the concentration of cyanide dust or gas that may be in the air. This should comply with Australian Standard AS 1716 Respiratory protective devices. If there is any possibility of high concentrations of hydrogen cyanide gas, use self-contained or air-supplied breathing apparatus.
- Respiratory equipment should be kept in order and ready for use at all times. Do not store the equipment where cyanides are used or stored.

Q4 What general rules should be used when handling cyanides?

- Do not work with cyanides alone or after hours
- Cyanides must only be handled by a person who has been assessed as proficient (see note).
- Do not mop up perspiration with either the sleeves of overalls, lab coats or with fabric which is kept in the areas where cyanides are used or stored.
- Remove pervious clothing immediately if wet or contaminated. This clothing should be stored safely in closed containers until laundered or disposed of via chemical waste. Under no circumstances should this clothing be taken home.
- Do not touch the nose, eyes or mouth when handling cyanides.
- Do not eat, drink or keep food, drinks or utensils in areas where cyanides are in use.
- Hands and face must be washed well before eating, drinking or smoking and before using toilet facilities.
- Decontamination of the work area is required on completion of work and any unused cyanide compound must be returned to a locked cupboard.

(Note: Proficiency (for the purposes of the University), is the achievement of a level of demonstrable knowledge, ability or skill acquired through instruction, which enables the operator to complete a high risk activity safely and without supervision. The requirement for a level of proficiency is identified as a control measure on the Risk Assessment. This level of instruction is required prior to workers undertaking an activity and a record is required to be maintained on file and recorded on the Training Plan (equivalent). A proficiency may be mapped against a Safe Operating Procedure, or could be via a log book or series of supervised training sessions/courses.)

Q5 How should I store cyanides?

- Keep workplaces dry (reaction of cyanides with water can produce the highly toxic and flammable gas hydrogen cyanide).
- Prevent contact with acids or acid fumes as hydrogen cyanide may be produced.
- Prevent contact with strong oxidising agents (e.g. nitrates, nitrites, peroxides and chlorates).
- Small quantities of cyanides should be stored separately in a locked poisons cupboard.
- Do not store respiratory equipment, clothing or other protective equipment where cyanides are kept.
- For large quantities please contact the HSW Team for advice.
- Please also refer to the Guide for preventing and responding to cyanide poisoning in the workplace 2013.

Q6 What should you do in the event of an emergency with cyanides?

- In all cases of cyanide exposure, even if the casualty appears to recover quickly, they should be taken to the nearest medical facility for assessment and monitoring by a registered medical practitioner.
- Follow the protocol from your risk assessment, safe operating procedure and safety data sheet.
- Please refer to the Guide for preventing and responding to cyanide poisoning in the workplace 2013.

Q7 Where do I obtain further information on working with cyanides?

If you require further information, please contact a member of the HSW Team.