Chemical Safety

Module 5

ROYAL SOCIETY OF CHEMISTRY

Health & Safety Essentials

Registered charity number 207890

Handling, and transport of dangerous substances in the laboratory

It is important not to use the store as a dispensing area. Spillage and other release of materials here could lead to a large scale chemical emergency. If the risk is present carry out dispensing, mixing and processing in areas that are designed for that purpose, that are fire resistant enclosures and suitably bunded, and ventilated with control of ignition sources.

Use good handling techniques to minimise spillages, and use spill trays or other liquid retaining methods to minimise liquid spread. Have proper supports for glass equipment, and place electrical equipment out of any enclosures wherever possible, so they are removed from the flammable area and can be isolated easily.

The risk of fire from a spill can rapidly involve other containers, such as dangerous substances, so think about this in advance and improve storage of chemicals in the area of use and handling.

Dispense in well-ventilated areas, and ensure those who do this are all competent and trained to do so. Always ensure the containers you are using are suitable for the substance(s) and labels are robust enough to stay legible.

The risk of fire from ignition of flammable materials generally occurs when there is a loss of containment. These losses arise from many lab activities such as failure to fully condense vapour from a distillation, overheating processes and so on but events are not confined to the lab location. In fact, one of the most difficult spillages to deal with is when flammable materials are being transferred from storage, normally outside, to the laboratory. Spillages en route expose other people to the risks from hazardous substances as well as fire from the many ignition sources outside the lab. Most labs have purpose made crates and carriers for transferring chemicals around the facility and these must be used to minimise the likelihood of spillages.

Transferring or decanting flammable liquids from drums or other large containers to lab sized bottles present a significant risk of loss of containment and fire. A number of techniques are available from pouring and pumping through to using a pipette but spillages of various sizes are common to all.

During the transfer of flammable liquids, it is possible to generate static charges that could discharge, usually to metal drums causing an ignition. However, this risk is low unless pumping at speed or spraying flammable liquids. The more likely source of static charge is from the person as they have walked to the store. The control measure is to have a store that is correctly earth-bonded with earth clamps available for the person to apply to metal containers before opening them.

When dispensing flammable liquids ensure that there is adequate control of sources of ignition:

- **that is smoking and smokers materials (less of a risk in the UK days due to new regulations in force)**
- **all maintenance work, that could produce heat, friction or sparks such as hot work**
- **electrical supplies, electrical equipment and any test equipment (designed to not produce a spark)**
- **keep cables away from corrosive substances or mechanical damage**
- **hot surfaces, pipe work, or light fittings, or any heating systems incorporating open flames**