

School of Chemistry SOP For Handling Azides And Other Potentially Explosive Materials

School SOP for Handling Azides and Other Potentially Explosive Material:

Organic azides are potentially explosive substances that can, and will, decompose with the slightest input of energy from an external source (e.g. heat, light, pressure). Additionally, small molecules containing the azido functionality tend to decompose violently, which may result in injury if proper safety precautions are not utilized. Generally, azides of high molecular weight are considered a low risk, whilst azides of low molecular weight are more problematic. High nitrogen content is another warning sign. If you intend synthesising, purifying or handling azides you must consult your Supervisor and the Safety Officer. The following safety precautions should be adhered to:

- Always use appropriate gloves when handling azides (the azide ion has a similar toxicity to the cyanide ion) and also use a plastic spatula for weighing.
- Sodium azide reacts violently with some common laboratory organics. When planning your experiment, always research the reactivity of sodium azide to ALL reaction components.
- Never use chlorinated solvents as reaction media (dichloromethane and chloroform will result in the formation of explosively unstable di- and tri-azidomethane respectively).
- All organic azides decompose with introduction of external energy and therefore must be stored below room temperature and in darkness.
- Never use distillation or sublimation as purification techniques. Purification should be limited to extraction and precipitation.
- Azide waste should be placed in a separate, labelled container and kept away from acid.

The following general precautions apply to any compounds that are potentially explosive (an extensive list of such compounds is given in the UCD Chemical Safety Manual).

- As with any chemical agent, its MSDS must be consulted to establish if it is explosive.
- Known explosive materials must be stored in a suitable manner away from incompatibles.
- No more than one day's supply of explosive material should be stored at the bench.
- All containers holding explosive materials must be clearly labelled as such.
- Potentially explosive materials must be only used in a fume hood behind a safety screen.
- Chemicals known to become explosive when dry (e.g. picric acid) should be regularly inspected and where necessary wetted.
- Chemicals known to become explosive after a period of time should be dated as to when they were opened and disposed of / stabilised before they become a risk.
- Keep all sources of ignition away from potentially explosive materials.