

Instructions for Writing Standard Operating Procedures (SOPs)

What is a Standard Operating Procedure (SOP)?

An SOP is a document establishing a procedure for working with hazardous chemicals or processes in a laboratory. A hazardous chemical is one that has a hazardous characteristic such as:

Flammable	Reactive
Corrosive	Cryogenic
Carcinogen	Inhalation Hazard
Toxic	Oxidizer
Radioactive	Explosive

The hazards of a chemical can be obtained from labels, Safety Data Sheets (SDS) and other references.

What are the benefits of an SOP?

- ✓ Instructs lab personnel clearly on the safe use of hazardous chemicals
- ✓ Serves as a training document
- ✓ Incorporates safety protocols into the regular steps of an experiment
- ✓ Eliminates guesswork for workers regarding safety decisions such as glove selection, use of fume hood, waste determinations, etc.
- ✓ Lab workers are more likely to follow a protocol when it is in writing

Types of SOPs – each is discussed in detail later

SOPs can be written in a lab specific manner. Some examples are:

- ✓ For a class of chemicals such as corrosives or flammables
- ✓ For a list of chemicals to be handled in a similar way
- ✓ Procedural – covers steps of an experiment and the chemicals used in it
- ✓ Chemical specific SOPs

Suggested Elements of an SOP

- Title of Procedure
- Date SOP written
- Date of most recent review
- Name of Principal Investigator (PI)
- Lab Location
- Lab personnel reviewing the SOP and the date of review
- List of chemicals in the procedure
- Potential hazards associated with the chemicals or the procedure
- Potential routes of exposure associated with the procedure such as inhalation, injection, skin/eye contact
- Description of how the risk increases with the quantity or concentration if applicable
- As applicable, a description of the potential use of less hazardous chemical substitutes
- Control measures (i.e., PPE, engineering controls, work practice controls, monitoring, animal use controls, etc.)
- A description of the process for cleaning the work area during and after the procedure
- A description of how and where the chemical will be safely stored
- If applicable, a description of how the chemical will be safely transported on campus
- A description the chemical waste disposal/disposition
- A description of procedures to be followed in the event of an emergency
- A description of any Occupational Health requirements necessary that are associated with the procedure, i.e., medical evaluation, baseline serum samples, respiratory fit testing, etc.)
- A description of how personnel will access SDS in the lab. A copy of the SDS should be included in the Chemical Hygiene Plan with the SOP.
- A description of the training that personnel must complete before using the chemical/procedure. This training should be documented.
- Describe the frequency for reviewing the SOP document
- List the steps of the procedure that include a hazard. For each step with a hazard, list the safety measures. This can be done in table form.

Types of SOPs:

Chemical Class SOPs

This type of SOP is more of a generic use type and is best suited for chemicals that are used sporadically as opposed to those that are consistently used.

For instance: you may have an SOP for general flammables and have items specific to flammables such as ...”store in a flammable cabinet or clean up a spill with a WYK sorbent product”, etc. Be as specific as possible. It is better to have an individual SOP for perchloric acid due to its special hazards than to include it on the general mineral acid list.

Similar Handling SOPs

This type of SOP is similar to the Chemical Class SOP but the chemicals may not necessarily have the same characteristics even though they have the same handling requirements.

For instance: you may have an SOP for dyes since they are generally used in a similar fashion.

Make sure you are not ignoring a secondary hazard for one of the chemicals. Some chemicals with similar uses may need different safety precautions (i.e., photographic chemicals are usually not hazardous but some are corrosive).

Procedural SOPs

This type of SOP is a step by step procedure and is the preferable format since it focuses on the process and not just the chemical. This type of approach ensures that other hazards such as physical hazards (i.e., heat, electricity, high pressure) are addressed.

Chemical Specific SOPs

Some chemicals are especially dangerous or require very specific handling so they may require their own SOP or a narrower category of SOP. For example, HF has designated area requirements and special spill and exposure procedures. Picric acid is explosive and needs to be stored so that it remains moist. Tetrahydrofuran and ethers are peroxide formers and need to be tested periodically for peroxides.

For SOP assistance, contact ehs_labsafety@utk.edu.

