

Guidance for Unattended Experiments

Unattended experiments pose a potential safety risk since a person is not available to intervene if something is going wrong. The common hazards of unattended experiments include fire, flooding, over pressurization of equipment, and hazardous material spills. Poor housekeeping around the experiment can exacerbate these hazards. Risk assessment, careful planning, proper set-up of experiments, and utilizing fail-safe controls all contribute to lowering the risks of unattended experiments.

General Considerations

- 1) Perform a risk assessment on the experiment to identify potential hazards. A tool to help perform a risk assessment can be found [here](#).
- 2) Utilize at least the same safety controls (such as a fume hood) as if the experiment were being performed while in attendance.
- 3) Ensure that the area around the experiment is free of clutter, combustible materials, flammable materials, and heat sources that are not part of the experiment. If used, fume hoods should be cleared of all unneeded materials.
- 4) Inspect all equipment prior to use to ensure it is in good working order, especially glassware that could have cracks or other flaws.
- 5) Inspect all electrical equipment and wiring for wear or damage. Do not use any equipment that is damaged. Make sure electrical wiring is not in accidental contact with any potential heat sources.
- 6) Secure experimental set-up in case of a seismic event.
- 7) Perform experiments at the smallest scale (least amount of hazardous material) as possible.
 - a. If the experiment is a first time scale-up of a procedure then do not leave it unattended.
- 8) Have an experienced lab member inspect your experimental set-up prior to leaving it unattended.
- 9) You should be in attendance of the experiment for sufficient time to ensure everything is working properly **BEFORE** you leave the experiment unattended. Ensure that temperature, pressure, water flow, etc. properly equilibrate. Correct any issues and repeat step 9.

Fail-Safe Controls

- 1) When heating is involved, use a thermocouple or a temperature overshoot protection to prevent accidental overheating.
- 2) Use flow alarms and/or flow shut-offs where possible.
- 3) If a risk assessment suggests that pressure may build in your experiment, incorporate a pressure relief device into the system and consider using a blast shield.
- 4) Consider using a recirculating pump and bucket as a water source instead of house water to minimize the potential for flooding. If pump and bucket cannot be used, ensure all tubing connections are secure.
- 5) Perform the experiment in a fume hood when hazardous materials are used. Make sure to shut the fume hood sash as low as possible.

Communication

- 1) Communicate to lab members that you are performing an unattended reaction, especially the Lab Safety Coordinator and/or lab manager.
- 2) Post signage describing the experiment close to its location and include any emergency shut down information. An example of a sign can be found [here](#).