

8.6 General Laboratories Policies

8.6.A General Guidelines

Standard operating procedures must be readily available to all laboratory employees. The following guidelines have been established to minimize or eliminate hazards in the laboratory. These guidelines have also been provided to maintain a safe laboratory environment. It is the responsibility of each person that enters into the laboratory to understand the safety and health hazards associated with potential hazardous materials and equipment in the laboratory. It is also the individual's responsibility to practice the following general safety guidelines at all times:

- 1) Read through and attempt to understand the assigned lab before attending the lab session.
- 2) All labs are locked at night on the weekends.
- 3) Person (s) working in the lab should try to avoid working alone after hours. If it is necessary for individuals to work alone in the lab, he/she must follow lab safety protocol. Prior to doing so, person (s) must get approval from the lab supervisor.
- 4) Labs begin on time and end on time. Do not be late in arriving, and do not expect to stay after the lab period is over. Students should come to lab expecting to spend the full lab hours. Do not make plans to meet someone or do something an hour after the lab starts. Labs might take 2-3 hours to complete.
- 5) Laboratory sessions generally begin with a short orientation that will consist of an overview and explicit instructions or examples as necessary. Pay careful attention. This might provide valuable insights for lab report.
- 6) Labs are designed in such a way that "lab reports" (Answer Sheets) must be completed and turned in before students leave the lab. Under no circumstances will a student be allowed to enter the lab, collect data, and then leave. Answer sheets are due at the end of the lab period.
- 7) While lab work is cooperative in nature, lab reports must be the work of the individual. Copying of lab reports or creation of "group reports" is not permitted. Individuals may, however, work together to understand fully the experiment and analysis.
- 8) All "lab reports" (Answer Sheets with required graphs) will be scored by the lab instructor with the use of a rubric, and lab reports will be returned at the beginning of the next lab period.
- 9) Leave the laboratory setup the way you found it at the beginning of the lab session; this greatly assists the lab instructor when preparing for the next lab section.
- 10) You generally should not be borrowing lab equipment from other individuals or tables without the lab instructor's permission. If you are missing an item or have an item that is not working, please inform the lab instructor. If you have borrowed something from another lab station, please return it when finished.
- 11) Bring a calculator and some scratch paper to each lab.

- 12) Lab reports will not be accepted from individuals who did not participate in the lab activity itself
- 13) Students with documented disabilities will be accommodated. Special need requests must be initiated through the Labs Department.
- 14) Fume hoods must be used when working with hazardous/toxic materials.
- 15) Reagent alcohol must not be purchased or brought onto KUST without consulting the lab directorate.
- 16) All general use bench top areas should be cleared off and cleaned at the end of the day.
- 17) No food or drink is permitted in the laboratory.
- 18) Cell phones must be turned off while in the laboratory.
- 19) Never engage in horseplay, pranks or other acts of mischief in chemical or biological work areas.
- 20) Never remove chemicals, biological agents, or radioactive materials from the facility without proper authorization.
- 21) Use either pen or pencil for lab work, but think before you write. Pencil has the advantage of ready erasure. Write lightly when recording data or answering questions. Any and all erasures should be thorough.
- 22) Report any accident, however minor immediately.

8.6.B Location of Safety Equipment

- 1) Emergency Exit Routes: There are signs on or above each door that can be used as an exit route during an emergency.
- 2) Fire Extinguisher: Pull safety pin out, point hose at base of fire, squeeze handle.
- 3) Eyewash Station: Should any substance be splashed in your eyes, wash them thoroughly. Bend so that eyes are over the spigots, force eyes wide open then push metal plate or remove plastic caps to start water flow.
- 4) First Aid Kit: Minor injuries such as small cuts can be treated effectively in the lab. Open the first aid kit to determine its contents and use as appropriate. **REPORT ANY INJURY TO YOUR INSTRUCTOR.**
- 5) Emergency Telephone: The phone in the prep area may be used to call for any emergencies.

8.6.C laboratory Safety

The laboratory zone can be a dangerous place. For instance, you may work with glass instruments, open flames, projectiles, electrical equipment, etc. If equipment is handled improperly, this can be quite dangerous even deadly. The lab instructor should caution you about lab safety procedures that must be followed. These procedures will be gone over in lab at the beginning of the period. Students failing to follow safety procedures will be removed from the laboratory setting if cautions are repeatedly ignored.

All laboratories should be provided with safety showers, eyewashes, and appropriate fire extinguishers. Adequate ventilation, wash sinks, and approved waste disposal receptacles are also necessary. All of these should be conveniently

located, properly maintained, and frequently tested. Special consideration should be given to ensure accessibility to safety equipment as well as ease of evacuation of physically disabled individuals.

8.7 Chemistry laboratory Safety

The chemistry laboratory is a place of discovery and learning. As such, it can also be a place of danger if proper common-sense precautions aren't taken. While every effort has been made to eliminate the use of explosive, highly toxic, and carcinogenic substances from the experiments which you will perform, there is a certain degree of unavoidable hazard associated with the use of a variety of chemicals and glassware. As a student, you are expected to learn and adhere to the following general safety guidelines to ensure a safe laboratory environment for both yourself and the people you may be working near. Each student will have to pass a lab safety exam before conducting any lab work to evaluate his/her understanding to the lab rules and safety precautions. Students who this exam will have to take an orientation session about lab safety before they can start lab work. Additional safety precautions will be announced in class prior to experiments where a potential danger exists. Students who fail to follow all safety rules may be asked to leave the lab or suffer grading penalties. Some of the materials used in the laboratories can be dangerous if mishandled, so the following safety rules and precautions are essential.

8.7.A Laboratory Apparel

- 1) Safety goggles must be worn at all times while in the laboratory. This rule must be followed whether you are actually working on an experiment or simply writing in your lab notebook. You must wear the safety goggles provided by the chemistry department.
- 2) Contact lenses are not allowed. Even when worn under safety goggles, various fumes may accumulate under the lens and cause serious injury or blindness.
- 3) Shoes must cover the entire feet. Shoes with open toes or other exposed skin, e.g. sandals, are prohibited in the laboratory.
- 4) Clothing must cover the entirety of the legs to protect against chemical spills.
- 5) Clothing must cover arms and shoulders to protect against chemical spills.
- 6) Clothing must not be loose or flowing to avoid contact with hazardous chemicals.
- 7) Hair must be secured back and off the shoulders in such a manner as to prevent it from coming in contact with hazardous chemicals or mechanical equipment, and to prevent contamination of the work environment. Application of cosmetics is prohibited in the laboratory.

8.7.B Laboratory Conduct

- 1) Experiments must never be left unattended.

- 2) Open flame devices must never be left unattended, e.g. hot plate, Bunsen burner, etc.
- 3) Eating, drinking, and smoking are strictly prohibited in the laboratory.
- 4) No unauthorized experiments are to be performed. If you are curious about trying a procedure not covered in the experimental procedure, consult with your laboratory instructor beforehand.
- 5) Ensure working condition of exhaust fan prior to fume hood use. Remove all items from the fume hood which are not necessary for the immediate operation or experiment.
- 6) Place all equipment necessary for the performance of experiments at least six inches inside the front face of the fume hood.
- 7) Perform all work that will release noxious vapors, fumes or aerosols at least six inches inside the front face of the fume hood.
- 8) Do not use the fume hood for handling and/or storage of hazardous materials during scheduled periods of fume hood maintenance and/or repair.
- 9) Never put anything into your mouth. Never directly smell the source of any vapor or gas; instead by means of your cupped hand, waft a small sample to your nose. Do not inhale these vapors but take in only enough to detect whether an odor may be present.
- 10) Laboratory water sources and deionized water should not be used for drinking water.
- 11) Coats, backpacks, etc., should not be left on the lab benches and stools. Please use the hook rack along the back wall at either end of the lab. There are coat racks just inside the each entrance to the balance room at the back of the lab. Beware that lab chemicals can destroy personal possessions.
- 12) Use the required procedure for the proper disposal of chemical wastes and solvents.
- 13) Always wash your hands before leaving the lab.
- 14) Learn where the safety and first-aid equipment is located. This includes fire extinguishers, fire blankets, and eye-wash stations.
- 15) Never block or even partially block the path to an exit or to safety equipment, such as a safety shower or fire extinguishers.
- 16) Supplies and laboratory equipment on shelves should have sufficient clearance so that, in case of a fire, the fire sprinkler heads are able to carry out their function.
- 17) The work area should be kept clean and uncluttered, with hazardous materials and equipment properly stored. Clean the work area upon completion of a task and at the end of the day. The custodial staff is only expected to perform routine duties such as cleaning the floor and emptying the general trash.
- 18) Notify the instructor immediately in case of an accident.

8.7.C Proper Handling of Chemicals and Equipment

- 1) Consider all chemicals to be hazardous unless you are instructed otherwise. Material Safety Data Sheets (MSDS) are available in the lab for all chemicals in use. These will inform you of any hazards and precautions of which you should be aware.
- 2) Know what chemicals you are using. Carefully read the label *twice* before taking anything from a bottle. Chemicals in the lab are marked with NFPA hazardous materials diamond labels. Learn how to interpret these labels.
- 3) Excess reagents are never to be returned to stock bottles. If you take too much, dispose of the excess properly.
- 4) Many common reagents, for example, alcohols and acetone, are highly flammable. Do not use them anywhere near open flames.
- 5) Always pour acids into water. If you pour water into acid, the heat of reaction will cause the water to explode into steam, sometimes violently, and the acid will splatter.
- 6) If chemicals come into contact with your skin or eyes, flush immediately with copious amounts of water and consult with your instructor.
- 7) Never point a test tube or any vessel that you are heating at yourself or your neighbor--it may erupt like a geyser.
- 8) Dispose of chemicals properly. Waste containers will be provided and their use will be explained by your TA. Unless you are explicitly told otherwise, assume that only water may be put into the lab sinks.
- 9) Clean up all broken glassware immediately and dispose of the broken glass properly.
- 10) Contact the stockroom for clean-up of mercury spills.
- 11) Never leave burners unattended. Turn them off whenever you leave your workstation. Be sure that the gas is shut off at the bench rack when you leave the lab.
- 12) Beware of hot glass; it looks exactly like cold glass.

8.8 Physics Laboratory Safety

Safety in the laboratory is very important. The experiments performed in the laboratory are designed to be as safe as possible, but caution is always advised concerning the use of all equipment. You must conduct yourself in a safe manner at all times in the laboratory, exercise caution in everything that you do, and report injuries, no matter how minor, immediately to the instructor.

8.8.A. General Precautions

All Laboratory Students, Assistants, Faculty, and Staff must abide by the following safety rules when using the Physics Laboratory. This list may be modified as deemed appropriate for specific situations.

- 1) No student is permitted in the laboratory without an instructor.
- 2) Students may not start an experiment until given permission by the instructor.

- 3) Students may not block the aisle in the laboratory with their bags, jackets, notebooks and other articles. Laboratory aisles must be kept uncluttered.
- 4) Handle all equipment with care; make sure that you understand the proper use and limitations of all equipment. When in doubt, ask the instructor.
- 5) Read the instructions on all warning signs and follow.
- 6) Wear safety goggles for laboratory activities such as projectile motion, centripetal force, and other labs that involve rapid motion or acceleration of any kind. The goggles are provided by the department and each person in the lab must wear them.
- 7) Long hair and loose items of jewelry or clothing **MUST** be secured during work with rotating machinery.
- 8) Do not lift heavy equipment without assistance.
- 9) Every student **MUST** know the use and location of all first aid and emergency equipment in the laboratories and storage areas.
- 10) Each student must be familiar with all elements of fire safety: alarm, evacuation and assembly, fire containment and suppression, rescue and facilities evaluation.
- 11) **NEVER** aim or fire a projectile motion device at a person.
 - a. When using the Air Tracks:
 1. Do not let air track carts run away from the user.
 2. Catch the cart before it crashes into the bumper or travels off from the table.
 3. Do not let the cart hit the motion sensor.
 - b. Keep hands clear of any fan blades, moving parts, or projectile launchers (other than to pull the trigger).
 - c. Glassware breakage and malfunctioning instrument or equipment should be reported to the Laboratory Assistant.
 - d. All accidents and injuries **MUST** be reported to the Laboratory Assistant or Faculty teaching the affected lab section. An Accident Report **MUST** be completed as soon as possible after the event by the Laboratory Specialist.
 - e. No tools, supplies, or other equipment may be tossed from one person to another; carefully hand the item to the recipient.
 - f. Closed toe shoes and long pants must be worn in the lab. Sandals and shorts are not allowed.
 - g. Eating, drinking, and smoking are strictly prohibited in the laboratory.
 - h. No unauthorized experiments are to be performed. If you are curious about trying a procedure not covered in the experimental procedure, consult with your laboratory instructor beforehand.
 - i. Casual visitors to the laboratory are to be discouraged and **MUST** have permission from the Teaching Assistant, Faculty Instructor of the section in question, or Laboratory Specialist to enter. All visitors and invited guests **MUST** adhere to all laboratory safety rules. Adherence is the responsibility of the person visited.

