

# NJIT Chemistry & Environmental Science Lab – Safety

## Introduction

Science is a hands-on lab class, where you will be doing many laboratory activities which require the use of chemicals, glassware and / or heating / cooling apparatus. All chemicals and apparatus are chosen for low hazard; but all also have some hazard associated with them.

Safety in the science classroom is a top priority for students, instructors, professors, NJIT and your parents. To ensure a safe Chemistry or Env't Science lab, a list of rules is provided in this safety contract. These rules must be followed. We ask you make two copies, sign one and turn in to the lab coordinator, and one to keep in your science notebook as a reminder of the safety rules.

## GENERAL RULES

**Goggles must be worn when chemicals, heat or glassware are in use.**

1. Conduct yourself in a responsible manner at all times in the laboratory.
2. Follow instructions carefully. If you do not understand a direction a procedure, ask the instructor before proceeding.
3. Do not work alone. No student may work in the laboratory without an instructor present or permission.
4. When first entering a Chemistry or Environmental Science lab be cautious of equipment, chemicals, and materials in the laboratory area.
5. You may not eat food or drink beverages, in the laboratory. Do not use laboratory glassware as containers for food or beverages.
6. Perform only those experiments authorized by the instructor. Never do anything in the laboratory that is not called for in the laboratory procedures or by your instructor. Carefully follow all instructions, both written and oral. Unauthorized experiments are prohibited.
7. Be prepared for the laboratory. Read all procedures thoroughly before the lab.
8. Treat the lab assignment seriously.

A casual attitude or behavior, even though meant to be just friendly may lead to an accident.

9. Observe good housekeeping practices. Work areas should be kept clean and tidy. Other materials (books, backpacks, etc.) should be stored in the classroom area.
10. Keep aisles clear. Push your chair under the desk when not in use.
11. Know the locations and operating procedures of all safety equipment; the first aid kit, eyewash station, safety shower, fire extinguisher, and fire blanket. Know where the fire alarm and the exits are located.
12. Always work in a well-ventilated area. Use the fume hood when working with volatile substances or poisonous vapors. Do not place your head into the fume hood.
13. Be alert and proceed with caution at all times in the laboratory. Please notify the instructor immediately of any unsafe conditions you observe.
14. Dispose of all chemical waste properly. Never mix chemicals in sink drains. Sinks are to be used only for water and those solutions designated by the instructor. Solid chemicals, metals, matches, filter paper, and all other insoluble materials are to be disposed of in the proper waste containers, not in the sink. Check the label of all waste containers before adding your chemical waste to the container.
15. Labels and equipment instructions must be read carefully before use. Set up and use the prescribed apparatus as directed in the laboratory instructions or by your instructor.
16. Keep hands away from face, eyes, mouth and body while using chemicals. Wash your hands with soap and water after performing all experiments. Please clean all work surfaces and apparatus at the end of the experiment. Return all equipment clean and in working order to the proper storage area.
17. Experiment in progress must be monitored at all times. Work at your assigned laboratory station.
18. Know what to do if there is a fire drill during a laboratory period;

- containers must be closed, - gas valves turned off, - fume hoods closed / turned off, and any electrical equipment turned off.

19. When using knives and other sharp instruments, always carry with tips and points pointing down and away. Always cut away from your body. Never try to catch falling sharp instruments. Grasp sharp instruments only by the handles.
20. If you have a medical condition (e.g., allergies, pregnancy, etc.), check with your physician prior to working in lab.
- 21. Any time chemicals, heat, glassware or mechanical operations are in use, students will wear laboratory goggles. There will be no exceptions to this rule!**
22. Contact lenses should **not** be worn in the laboratory unless you have permission from your instructor.
23. Dress properly. Long hair, dangling jewelry, and loose or baggy clothing are a possible hazard in the laboratory. Long hair must be tied back and dangling jewelry and loose or baggy clothing must be secured. Shoes must completely cover the foot. No sandals allowed.

## Accidents / Injuries

24. Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the instructor immediately, no matter how trivial it may appear.
25. If you or your lab partner are hurt, immediately.
26. If a chemical splashes in your eye(s) or on your skin, immediately flush with running water from the eyewash station, faucet or safety shower for at least 7 minutes. Notify the instructor immediately.
27. When mercury thermometers are broken, mercury must not be touched. Notify the instructor immediately. There are standard Hg Clean up kits (suction bottles, sulfur powder plus sweep-up).

## Handling Chemicals

28. All chemicals in the laboratory are

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- to be considered dangerous. Do not touch, taste, or smell any chemicals, unless specifically instructed to do so. If required - the proper technique for smelling chemical fumes will be demonstrated to you.
29. Check the label on chemical bottles before removing (taking) any of the contents. Take only as much chemical as you need.
  30. Never return unused chemicals to their original containers.
  31. Never use mouth suction to fill a pipet. Use a rubber bulb or pipet pump.
  32. When transferring reagents from one container to another, be sure the containers are well supported and keep away from your body.
  33. Acids must be handled with extreme care. Always add acid to water, swirl or stir the solution and be careful of the heat produced, particularly with sulfuric acid.
  34. Handle flammable hazardous liquids carefully. Never dispense flammable liquids near an open flame or source of heat.
  35. Do not remove chemicals or other materials from the laboratory area.
  36. Take care when transporting acids and other chemicals from one part of the laboratory to another. Hold them securely and walk carefully.

### **Glassware and Equipment**

37. Carry glass tubing, especially long pieces, in a vertical position to minimize the likelihood of breakage.
38. Do not handle small broken glass with bare hands. Use a brush and dustpan to clean up broken glass. Place broken or waste glassware in the designated glass disposal container.
39. Inserting and removing glass tubing from rubber stoppers can be dangerous – lead to serious cuts. Always lubricate glassware (tubing, thistle tubes, thermometers, etc.) that is being inserted into a rubber seal/ stopper. Be careful. You may protect your hands with towels or gloves when inserting or removing glass tubing into a rubber stopper. If a piece of glassware is “frozen” in a stopper, take it to your instructor for removal.
40. Fill wash bottles only with distilled

- water and use only as intended, e.g., rinsing glassware and equipment, or adding water to a container.
41. When removing an electrical plug from its socket, grasp the plug, not the electrical cord. Hands must be completely dry before touching an electrical switch, plug, or outlet.
  42. Examine glassware before each use. Do not use chipped or cracked or dirty glassware.
  43. Report damaged electrical equipment. Look for frayed cords, exposed wires, and loose connections. Do not use damaged electrical equipment.
  44. If you do not understand how to use a piece of equipment, please ask the instructor for help.
  45. Do not immerse hot glassware in cold water; it may shatter.

### **Heating**

46. Exercise extreme caution when using a gas burner. Take care that hair, clothing and hands are a safe distance from the flame at all times. Do not put any substance into the flame unless specifically instructed to do so. Never reach over an exposed flame. Light gas (or alcohol) burners from the side.
47. Do not leave a lit or active burner unattended. Do not leave anything that is being heated or is visibly reacting unattended. Always turn the burner or hot plate off when not in use.
48. Do not point the open end of a test tube being heated at yourself or anyone else.
49. Heated metals and glass stay hot for a long time. They should be set on thermal pad to cool and picked up with caution. Use tongs or heat-protective gloves.
50. Never look into a container that is being heated.
51. Do not place hot apparatus directly on the laboratory desk. Always use an insulating pad. Allow time for hot apparatus to cool before touching it.
52. When bending glass, allow time for the glass to cool before further handling. You can determine if an object is hot by bringing your hand close (not touching) to it.

## **NJIT Chemistry & Environmental Science Lab – Safety (Agreement) Questions**

1. Do you wear contact lenses?  
\_ YES \_ NO

**If yes please see Lab Instructor for directions with Goggles**

2. Are you color blind?  
\_ YES \_ NO

**If yes please be sure to verify colors in lab experiments with your partner or a fellow student or lab instructor**

3. Do you have strong allergies?  
\_ YES \_ NO

**If yes – please check with your doctor for avoidance of specific chemicals in the chemistry lab.**

### **Agreement**

I have read and agree to follow all the safety rules set forth in this contract. I realize that I must obey these rules to insure my own safety, and that of my fellow students and instructors. I will cooperate with my instructor and fellow students to maintain a safe lab environment. I will also follow the oral and written instructions provided by the instructor. I am aware that any violation of this safety contract that results in unsafe conduct in the laboratory or misbehavior on my part may result in being removed from the laboratory, receiving a failing grade for the lab, and/or dismissal from the course.

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Student Name

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Student Signature

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Date

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Course

### **Remember - Please Wear Your Safety Goggles**

*(Please SIGN, REMOVE and RETURN this agreement to your lab instructor)*

**Dr. Hussain, Mr. Gandhi and Dr. Farinas**