

# **Rajiv Gandhi Institute of Petroleum Technology, Jais, Amethi**

## **Laboratory Safety Rules and Regulations**

### **GENERAL RULES**

1. Working alone in the laboratory is strictly not allowed. Do work in the laboratory during working hours as per instructions by your supervisor/ laboratory in-charge.
2. Use common sense and do not rush in the laboratory. Never be complacent about chemicals or chemical reactions.
3. You must wear lab coat and safety goggle at all times in the laboratory. You are responsible for your lab coat and safety goggle.
4. When you are using gloves and working in the laboratory, do not touch switches, door latches, computer keyboards, even your own laptop and bags. Gloves may contaminate common / public items.
5. Face shield must be worn, if needed. Use mask as per the instruction, when working with toxic and volatile chemicals / reagents.
6. You must be covered continuously from shoulders to below the knees and must wear shoes that cover your feet. Bare feet, sandals, shorts, sleeveless shirts, short shirts, and short skirts are unsafe and must not be worn in laboratory. For fire safety, flammable materials, loose clothes and neck ties should not be worn, and long hair should be tied back. Full coverage by (cotton) clothing and leather shoes offers the best protection against chemical spills and fire.
7. Everyone should know the location and operation of the laboratory safety equipment. This includes the eyewash, fire extinguishers, deluge shower, and fire blanket.
8. Keep your workspace clean and tidy. The working space, desk drawers, cabinets, and instruments must be kept neat and clean at all times. If you have any issue related to work place and equipment (minor/major), please discuss with laboratory in-charge.
9. Ensure an uninterrupted water supply before you start your experiment.
10. Do not carry out any non-instructed and/or unauthorized experiment.
11. When lab work is completed, all materials must be returned to their proper places and the working benches, instruments and glassware must be cleaned up.

12. Many chemicals are toxic and/or corrosive. Chemical reagents require careful handling. Therefore, it is mandatory to strictly follow-up handling and safety instructions. Please be aware of symbols, descriptions and codes of safety, risk and hazardousness of chemicals.
13. Be familiar with the following terminologies and their effects.
  - FLAMMABLE : They burn.
  - IRRITANTS : They irritate eyes, lungs and skin.
  - TOXIC : They are poisonous, effective either the short or long term.
  - CARCINOGENIC : They cause cancer.
  - TERATOGENIC : They cause defects in the unborn fetus.
  - MUTAGENIC : They cause genetic mutations.
  - EXPLOSIVE : They explode, usually on being mixed with air.
  - CORROSIVE : They burn the eyes, lungs and skin.
14. Read the label twice and understand the meaning of given safety and risk codes on chemical bottle before taking any chemical/reagent.
15. Take the exact amount of reagent indicated. Larger amounts will not be more effective and may lead to uncontrollable reactions.
16. Never return unused chemicals to stock bottles. Dispose properly.
17. Do not taste or ingest any chemical in the laboratory. Do not keep food or drink items at your laboratory working bench. It may be contaminated with chemicals and be unsafe. For the same reason, you should not bring food or drink items into the laboratory (except in seating room). Laboratory chemicals that may have toxic properties dissolve in foods, or beverages in the laboratory.
18. Do not use laboratory equipment such as electric/microwave oven and refrigerator to keep any eatable and drinkable items.
19. Never use laboratory glassware for drinking and eating purpose.
20. Bringing any chemicals/glassware/goggles out of the laboratory for personal use will not be tolerated.
21. Never heat inflammable solvents, even small amounts, with or near a flame. As for refluxing or distillation, never place solvents in an open beaker. Pouring solvents in the vicinity of a flame is extremely hazardous. Use an oil bath, steam bath, water bath, heating mantle, or hot plate as a heat source whenever is required.
22. If an inflammable solvent is spilled, have all workers at the desk turn off their burners and clean it up immediately using a cloth.

23. Inflammable solvents, which you may have contact with, are ether, ligroin (petroleum ether), cyclohexane, toluene, xylene, alcohols, ethyl acetate, carbon disulfide, acetone, dioxane, etc. If in doubt about the inflammability of a solvent, assume that it is hazardous.
24. Benzene and chlorinated solvents are toxic. In some cases, the toxic effect is cumulative. Avoid contact with the skin and inhalation of solvent vapors.
25. Corrosive substances, which give off noxious fumes (e.g., bromine, acetyl chloride, benzyl chloride, phosphorus trichloride, acetic anhydride, fuming nitric and sulfuric acids, chlorosulfonic acid, benzene sulfonyl chloride, etc.), should be handled in the fume hoods. Use proper gloves. Do not spill these chemicals on yourself or on the working benches. They will cause very painful burns. Bromine is especially bad. Do not put any of these in waste cans / trash-boxes.
26. Over the last several years, a number of organic compounds have been confirmed as carcinogens and the list is steadily growing. It is best to assume that all chemicals are toxic, and possibly carcinogenic.
27. Sodium and potassium metals react explosively with water. They are rapidly corroded by the atmosphere and should be stored in kerosene or oil. These metals should not be allowed to come into contact with the skin. They may be handled with dry filter paper or tweezers. Unused pieces of metal may be destroyed by dropping into 95% ethyl alcohol. Avoid contact between chlorinated solvents and sodium or potassium.
28. Never pipette by mouth. Drawing up a liquid should be done only with a rubber bulb or micropipette.
29. Make sure to be in a safe position/place before helping others.
30. In case if a person's clothing catches on fire, he/she needs help. Prevent him from running. If he/she is close enough, put him/her under the safety shower because it is more effective than a blanket. If not, make him lie down and smother the flames by rolling, wrapping with lab coats, blankets, towels, etc. *Never turn a carbon dioxide extinguisher on a person.*
31. If a fire breaks out, (if time allows) turn off all burners, hotplates and remove solvents, place the chemical and equipment safely to the nearest possible table/bench, exit the building calmly.
32. There are carbon dioxide extinguishers in and around the laboratory and the positions and operation of these should be known. Point the extinguisher at the base of the flames.
33. Doors of laboratory should not be blocked by any items and should not be locked permanently. Glass window of each door of laboratory/seating room should not be covered/painted.

34. Report the location of the emergency with need of help; give your name, laboratory name, and lab location on following emergency numbers:

- Security Office (RGIPT)  
Rajesh Vishwakamra (Assistant Security Officer)  
Telephone : 4751  
Mobile : 7800617941
  
- Health Centre (RGIPT)  
Telephone : 4613
  
- Ambulance Service (RGIPT).  
Mobile: 7081482420 / 9919281154