

Safe Use of Volatile Chemicals in Biological Applications

Ensuring laboratory safety when handling volatile chemicals is critical to preventing hazardous exposures and maintaining compliance with safety regulations. Many research experiments involve both biological and chemical hazards within the same workflow. Recognizing these hazards and implementing proper safety controls helps mitigate risks and prevent accidents.

Common Volatile Chemicals in Biomedical Research

Several chemicals commonly used in nucleic acid extraction and protein analysis pose significant health hazards. These include toxic compounds such as: Beta-mercaptoethanol, chloroform, trizol, and phenol, the latter two are also corrosive. Proper handling procedures must be followed to minimize exposure.

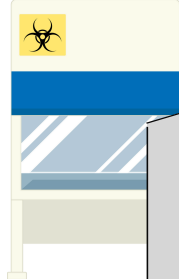


Fun FAQ!

Volatiles present various hazards, including inhalation toxicity, skin and eye irritation, and corrosive effects.

Safe Handling Practices

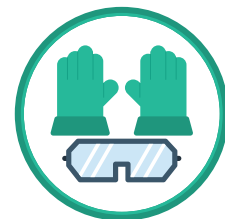
To reduce exposure risks, the following safety measures must be implemented:



Engineering Controls: Use volatile chemicals inside a chemical fume hood to prevent inhalation risks. Biosafety cabinets should only be used when necessary for biological decontamination. Once biological hazards are eliminated, all subsequent manipulations should take place in a fume hood.

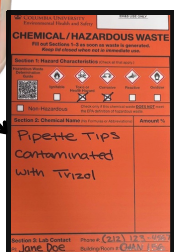
Administrative Controls: Laboratory protocols and standard operating procedures (SOPs) should be regularly updated, and hands-on training must be provided for new personnel handling hazardous chemicals.

Personal Protective Equipment (PPE): Proper PPE must be worn, including lab coats, safety glasses or goggles, and chemical-resistant gloves.



Proper Waste Disposal

Volatile organic chemicals must be collected in designated chemical waste containers. Chemically contaminated solid waste, including disposable sharps and pipette tips, should be placed in puncture-resistant containers provided by EH&S. Items contaminated with volatile chemicals must not be disposed of in Regulated Medical Waste containers (red bags or medical sharps containers). One-gallon solid waste containers and labels can be requested through the chemical waste supplies request form (QR Code).



Chemical Compatibility Considerations

Certain chemicals, including Trizol and phenol, are incompatible with bleach and should never be mixed. Chemical waste should not be aspirated into tissue culture collection flasks. All liquid chemical waste must be collected separately in designated waste containers.

Have more questions? Reach out to EH&S at Labsafety@columbia.edu or give us a call

CUIMC: (212) 305 - 6780

Manhattanville/Morningside: (212) 854 - 8749



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