## Standard Operating Procedure

# **Potentially Explosive Chemicals**

## Overview

Potentially explosive chemicals (PEC) are materials that are capable of undergoing a sudden release of pressure, gas and heat when subjected to an initiating mechanism. Initiating mechanisms include: friction, impact, addition of a catalyst, light, and heat. Examples include organic peroxides (R-O-O-R’), picrate salts, azides, and trinitro compounds. This rapid release of large amounts of energy poses as serious threat to the health and safety of laboratory personnel.


## Special Handling and Storage Concerns

**Personal Protective Equipment**

* Flame Resistant Lab Coat.
* Nitrile or Neoprene glove are adequate for possible incidental exposure. Consult a glove chart if large splashes or immersion are possible.
* ANSI Z87.1-compliant safety glasses. Safety goggles plus face shield if a large splash hazard exists.

**Special Storage Requirements**

Store at the manufacturer’s recommended temperature in an explosion-proof refrigerator/freezer or cabinet. Use secondary containment. Store away from flammable or other chemically incompatible materials. Label storage area with the above GHS pictogram and the words EXPLOSION RISK. Keep away from heat, light, and any other possible initiating mechanisms. Limit the amount of material in storage to the amount needed in the immediate future.

*Picric Acid and Perchloric Acid:*  should be stored away from metals and metal salts. Picric acid becomes most explosive when dry, and therefore must contain at least 10% water for inhibition. If a bottle of Picric acid of unknown age or condition is found in the lab, isolate the area and contact EH&S. Perchloric acid should be stored by itself, away from all other chemicals.

**Engineering Controls**

*Fume Hood:* PEC should be handled in a fume hood. Keep the fume hood sash at the lowest level possible while working, and closed when the hood is not in active use.

*Blast Shield:* The use of a portable blast shield inside the fume hood is highly recommended.

**Special Handling Considerations**

*Scale*: Design experiments to use the least amount of material possible to achieve the desired result. The PI must communicate and enforce clear limits on the scale at which PEC can be used or generated. It is recommended that prior approval from the PI be required for scale-up operations in excess of 3-fold.

*Initiating Mechanisms:* Before beginning work, determine the initiating mechanism for your specific material by consulting the SDS or other literature. Be aware of any equipment that can generate static electricity or sparks.

Never work alone when handling PEC.

**Decontamination**

This SOP covers a wide range of materials. Consult the SDS for any possible special decontamination procedures.

## Waste Management

Collect PEC in sealed containers protected from light and heat. Contact EH&S for prompt removal.

## First Aid and Emergencies

**Spill**

Notify others in the area of the spill, including your supervisor. Evacuate the location where the spill occurred. Call 911. Remain on-site (at a safe distance) to provide detailed information to first responders. Do not attempt to clean up the spill yourself.

**Fire**

Standard firefighting measures apply.

**Personnel Exposure**

Standard measures apply.

## Laboratory Specific Information

**Prior Approval Required**

[ ]  **NO**

[ ]  **YES (describe):**

**Designated Area**

[ ]  **Entire Laboratory Area**

[ ]  **Other (describe):**

**Experimental Conditions of Use**

**Temperature Range:**

**Pressure Range:**

**Scale Range (REQUIRED FOR PEC):**

**Other Relevant Details:**