***STANDARD OPERATING PROCEDURE – C007***

**NOVEL CHEMICALS WITH UNKNOWN HAZARDS**

1. **Objectives**

The objective of this document is to establish standard operating procedures for working with novel chemicals with unknown hazards, ensuring the safety of laboratory personnel by minimizing any potential risk. Additionally, this SOP seeks to optimize the effectiveness of experimental processes.

1. **Personal Protective Equipment**

To ensure safety during work with novel chemicals, or any synthesized materials related, appropriate personal protective equipment (PPE) must be worn. This includes:

* Long pants and closed-toe shoes to protect against spills and splashes.
* A long-sleeved, buttoned lab coat to minimize skin exposure.
* Safety glasses or goggles to protect against splashes or flying debris.
* Disposable **nitrile/neoprene/viton** gloves to prevent direct contact with hazardous chemicals. Consult with your PI or supervisor to determine whether any materials involved in your process require alternative hand protection.
* If the user has long hair, it should be tied back.

1. **Potential Hazards**

When working with novel chemicals, safety precautions must be taken to manage and maintain a safe working environment. There are several hazards a user can come into contact with and these include:

* **Potential Hazard:** The hazards of these novel materials can be anticipated based on what is known about similar, established materials. In such cases it’s prudent to presume that a derivative is at least as hazardous as its parent compound, and to take similar precautions when storing and/or handling it. In all cases, a material with unknown hazards should be presumed to be hazardous until reasonably foreseeable health and/or physical hazards can be ruled out experimentally.

1. **Training**

Ensure all personnel have received proper training on their hazards and safe handling techniques.

* MC03 Chemical Safety II / Hazardous Waste Management
* MC07 Chemical Safety I / Chemical Safety for Laboratory Users

1. **Procedures**
2. Storage and handling

* Store in secondary containment in a cool, dry place away from other materials that are reasonably anticipated to be chemically incompatible. If the material is reasonably anticipated to be a potential explosive, it must be stored away from light in an explosion-proof refrigerator/freezer or an explosion-proof cabinet. Each container’s label must include any appropriate pictograms and identify the material as hazardous.
* Containers of these materials should be stored in leak-proof secondary containment.
* If the material is reasonably anticipated to be acutely toxic, carcinogenic, or a reproductive toxicant, it must also be stored within a designated area. The secondary container’s label must include any appropriate pictograms and identify the material as hazardous.

1. Disposal

* Refer to the SOP titled “Disposal of hazardous chemical waste” for more details. Please note that some carcinogens and acute toxicants may be considered Extremely Hazardous when disposed of as waste.
* Check the waste log sheet and avoid possible incompatibility.
* Consider the Lab pack Waste Scheme for highly reactive unknown chemicals. Seal the container in a plastic bag or other compatible material if the original container is damaged or not in good condition, such as leakage. Keep the label intact or label the packing properly.

1. **Spills, Incidents and Reporting**

* All spills must be cleaned up following Standard Operating Procedure.
* In the event of a fire, activate the fire alarm and evacuate the area. Do not activate the emergency ventilation system, as they can exacerbate combustion.
* Skin Contact: Immediately remove contaminated clothing and shoes; flush skin with water for at least 15 minutes. Get medical attention immediately.
* Eye Contact: Check for and remove contact lenses. Immediately flush eyes with water for at least 15 minutes. Seek medical attention immediately.
* Inhalation: Move person into fresh air. Get medical attention immediately.
* Ingestion: Get medical attention immediately.
* Report any accidents that result in injuries to the PI and/or the departmental safety officer (DSO) immediately.
* For serious incidents, notify the Security Unit immediately by calling the 24-hour hotline on **2358 8999**.

1. **References**

* Texas Woman's University. (n.d.) *Standard operating procedure for novel chemicals with unknown hazards*.
* Safety and Environmental Protection Manual - *Chapter 8: Chemical Safety* | Health, Safety and Environment Office - The Hong Kong University of Science and Technology. Retrieved on 26 June 2025 from <https://hseo.hkust.edu.hk/sm_08>
* Health, Safety and Environment Office - Hong Kong University of Science and Technology(n.d.). *Laboratory Emergency Preparedness and Response Video*, from <https://hseo.hkust.edu.hk/node/3653>