***STANDARD OPERATING PROCEDURE – E013***

**ROTARY EVAPORATOR**

1. **Objectives**

The purpose of this SOP is to ensure the safe and efficient operation of the rotary evaporator for the concentration or purification of solvents and samples. This procedure outlines the steps for proper use, potential hazards, and emergency response protocols.

1. **Personal Protective Equipment**

To ensure safety during work with tamoxifen, 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 with side shields to protect against splashes.
* Disposable nitrile gloves to prevent direct contact with hazardous chemicals.
* If the user has long hair, it should be tied back.

1. **Potential Hazards**

* **Chemical Exposure:** Solvents or samples may be toxic, corrosive or flammable.
* **Thermal Hazards:** Hot surfaces, heated water/oil baths and steam can cause burns.
* **Mechanical Hazards:** Moving parts (e.g., rotating flask) can cause entanglement or injury.
* **Implosion or Explosion:** Improper use or pressure changes can cause glassware to break. Present of organic-peroxide.
* **Electrical Hazards:** Malfunctioning equipment or improper connections can cause shocks or fires.

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
* DC04 Electrical Safety

1. **Procedures**

##### **Pre-Operation:**

* **Visually inspect the rotary evaporator for cracks, damage, or signs of wear.**
* **Confirm all glassware (flasks, condensers) is intact and securely fastened.**
* **Verify functionality of the vacuum pump, cooling system, and local exhaust ventilation.**
* **Use only solvents and samples chemically compatible with glass and equipment materials.**
* **Conduct a peroxide test for samples containing organic solvents.**
* **Fill the evaporation flask to ≤50% capacity to prevent overflow.**
* **Securely attach the sample flask to the rotary evaporator.**
* **Connect the condenser and ensure cooling water is circulating (check hoses for leaks).**
* **Set the temperature-controlled bath (water/oil) to the recommended level for the solvent.**

##### **Operation:**

* Start rotation at a low speed and gradually increase to the target rate.
* Slowly engage the vacuum pump to avoid abrupt pressure changes.
* Adjust vacuum strength to maintain steady evaporation without bumping.
* Close local exhaust enclosure doors to reduce vapor exposure.
* Continuously check for leaks, irregular noises, or pressure instability.
* Ensure smooth solvent evaporation and stable flask rotation. Do not leave the system unattended.

##### **Post-Operation:**

* Gradually release the vacuum and halt rotation.
* Turn off the heating bath and cooling system.
* Carefully detach the flask and transfer the concentrated sample.
* Clean glassware and components per lab guidelines (e.g., rinse with compatible solvent).
* Store the rotary evaporator in its designated area, ensuring all parts are dry and secure.
* Close local exhaust doors post-use to minimize energy use and residual chemical exposure.

1. **Incident Reporting**

In case of chemical spills, immediately stop the process. All spills must be cleaned up following Standard Operating Procedure xxx - Cleanup of Chemical Spills.

* In case of glassware breakage, immediately stop the process. All glassware breakage must be cleaned up following Standard Operating Procedure xxx.
* 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.
* Report any incidents resulting in injuries to the Principal Investigator (PI) and/or the departmental safety officer (DSO) immediately.
* For serious incidents, contact the Security Unit immediately by calling the 24-hour hotline on 2358 8999.

1. **References**

* Ward, A. (2016). *SOP\_SMB050: Using a rotary evaporator with a water aspirator or pump.* Risk Assessment. The University of Sydney.
* Fisher, D. & Shepherd, N. (2014). *SOP SMB050.1 (DF NS 0614): Using a rotary evaporator with water aspirator or pump.* The University of Sydney*.*
* Health, Safety and Environment Office, The Hong Kong University of Science and Technology (2014). *Chapter 7: General Laboratory Safety.* Retrieved on June 30, 2025, from https://hseo.hkust.edu.hk/sm\_07