***STANDARD OPERATING PROCEDURE – E012***

**Using Bunsen burners**

1. **Objectives**

The objective of this document is to establish standard operating procedures for the use of Bunsen burners, ensuring the safety of laboratory personnel by mitigating potential risks associated with hazardous materials, and injuries. In addition, this SOP aims to enhance the efficiency of experimental workflows.

1. **Personal Protective Equipment and Practices**

To ensure safety during the use of Bunsen burners, appropriate personal protective equipment (PPE) must be worn. This includes:

* Long pants and closed-toe shoes to protect against spills and burns.
* A long-sleeved, buttoned lab coat to minimize skin exposure.
* Safety glasses to protect against sparks, splashes or flying debris.
* Disposable nitrile or latex gloves to prevent direct contact with hazardous materials.
* Heat-resistant gloves for handling hot glassware or equipment.

When working with Bunsen burners, long hair must also be tied back and do not wear loose-sleeved clothing.

1. **Potential Hazards**

Using Bunsen burners presents various hazards that must be managed to maintain a safe working environment. These include:

* **Fire Hazard:** Improper use of Bunsen burners can ignite flammable materials or lead to the spread of fire.
* **Severe Burns:** Contact with the flame or hot surfaces can cause burns to personnel.
* **Gas Leakage:** Malfunctioning equipment or damaged tubing can lead to gas leaks, increasing the risk of inhalation or fire.
* **Explosion Risk:** Inadequate handling or gas accumulation can result in explosions.

1. **Procedures**
2. Before lighting a Bunsen burner:

* Familiarize yourself with the location of the laboratory’s main gas shut-off valve and the fire fighting equipment such as the fire extinguisher and fire blanket**.**
* Inspect the Bunsen burner and rubber gas tubing for damage, cracks, or leaks. Replace any damaged components before use. If cracks or leaks are found or the tubing is expired, discard the tubing and obtain a replacement.
* Position the Bunsen burner at least five centimeters away from overhead shelves, equipment, or light fixtures.
* Clear the work area of papers, notebooks, flammable materials, and excess chemicals.
* Place a heat-resistant pad under the Bunsen burner if the work surface is not heat-resistant.
* Wear appropriate PPE.
* Connect one end of the rubber tubing to the Bunsen burner and the other end to the gas line at your lab bench.
* Gather a spark lighter for ignition.
* Inform others in the laboratory that the burner will be in operation.

1. Lighting a Bunsen burner:

* Before turning on the gas, ensure you have a spark lighter with an extended nozzle to ignite the burner. Never use matches.
* Close the air hole on the burner to facilitate lighting.
* Slowly turn the gas control valve on the burner to allow gas to flow.
* Using a spark lighter, ignite the gas at the top of the burner. Keep your hand away from the flame as you do this.
* After the burner is lit, adjust the air supply to achieve the desired flame type.
* Regulate the air supply to achieve a small, bright blue, cone-shaped flame.

1. During Use:

* Ensure that the area around the Bunsen burner is free of flammable materials, chemicals, and clutter to prevent accidental fires.
* Do not leave a lit Bunsen burner unattended.

1. After Using a Bunsen burner:

* Turn off the gas supply once you have finished using the burner.
* Remember that any items heated with a Bunsen burner are likely to be very hot.
* Avoid touching any apparatus with your bare hands unless the surrounding air feels cool.
* Allow the burner to cool before handling it.
* Ensure the main gas valve is turned off before leaving the laboratory.
* Do not place hot apparatus on paper or other flammable materials, allow items to cool in place before handling.

**5) Incident Reporting**

* Report any accidents resulting in injuries to the Principal Investigator and/or the departmental safety officer (DSO) immediately.
* For serious incidents, notify the Security Unit immediately by calling the 24-hour hotline on **23588999**.

**6) References**

* Dimauro, J. (2016). *SOP\_SMB006.2: Using Bunsen Burners.* Risk Assessment. The University of Sydney.
* Coleman, N. & Kant, S. (2014). *SOP SMB006.2 (SK NC 0614): Using Bunsen burners.* The University of Sydney*.*
* Hkedcity.net. (2025). *Information about Approved Gas Tubing for Bunsen Burners*. [online] Available at: <https://cd1.edb.hkedcity.net/cd/science/laboratory/safety/gas_tubing.htm>