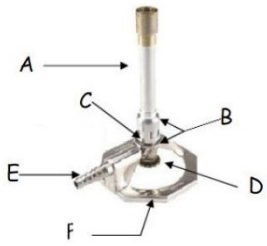
TEXAS A&M UNIVERSITY SAN ANTONIO
Research and Academic Environmental Health & Safety

Guidelines: Bunsen Burner

BUNSEN BURNER is a laboratory instrument that can be used to provide a single, continuous flame by mixing gas with air in a controlled fashion. The ratio of gas to air that is mixed together can be manually adjusted, allowing the user to control the intensity, temperature, and size of the flame. The flame can then be used to heat or sterilize laboratory reagents and equipment.

1.0 Parts of the Bunsen burner



A. Barrel - where gas and air are mixed

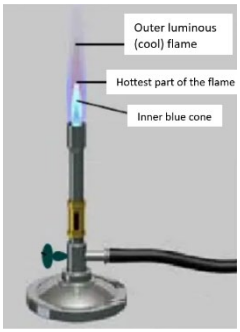
B. Collar – adjust the air intake

C. Air intake openings – air enters here

D. Gas Flow Value – regulates the flow of gas (can also be controlled from table gas valve)

E. Gas Intake Tube – gas enters burner from table source

F. Base – supports burner



2.0 Potential Hazards

- Bunsen burner flames can cause burns. Keep body parts clear!
- Bunsen burner flames can start fires if flammable materials are nearby. Keep flammable materials well clear, and do not leave Bunsen burner unattended.
- Bunsen burner can create stuffy and hot atmosphere. Only use in well-ventilated areas.

3.0 General Safety Procedures (best practice):

- Place the Bunsen burner away from any overhead shelving, equipment, or light fixtures.
- Remove all papers, notebooks, combustible materials and excess chemicals from the area. Watch out for paper notes hanging on shelves above bench
- Tie-back any long hair, dangling jewelry, or loose clothing.
- Inspect hose for cracks, holes, pinched points, or any other defect and ensure that the hose fits securely on the gas valve and the Bunsen burner.
- Replace all hoses found to have a defect before using.
- Utilize a sparker/lighter with extended nozzle to ignite the burner. Never use a match to ignite burner.
- Have the sparker/lighter available before turning on gas.
- Adjust the flame by turning the collar to regulate air flow and produce an appropriate flame for the experiment (typically a medium blue flame).
- DO NOT leave open flames unattended and never leave laboratory while burner is on.
- Shut-off gas when its use is complete.
- Allow the burner to cool before handling.
- Ensure that the main gas valve is off before leaving the laboratory.
- Ensure no flammable materials are close to the flame. Ethanol dishes for spread plating should be >50 cm away.
- Other solvents should be put away in solvent storage lockers (these lockers should be >3 m from an ignition source)
- Routinely check Bunsen tubing for leaks and corrosion. Replace tubing if any evidence of corrosion is present.

- Ensure user is properly trained or supervised. For junior scientists, ensure proper instruction by coordinators/ demonstrators/ supervisors.
- Ensure Bunsen is correctly and tightly fitted to gas outlet.
- Ignite the Bunsen on the safety flame. Can leave on safety flame if doing spread-plating with ethanol. Switch to hot flame if you need to sterilize an inoculating loop, or if you need a strong updraft to create a sterile work area.
- Double check the gas outlet is properly closed and the Bunsen flame extinguished before leaving the lab.

4.0 Additional Precautions

- Do not use a Bunsen burner in biological safety cabinet.
- Do not use a constant flame Bunsen burner to create a sterile field. Biosafety cabinets and laminar flow hoods create a sterile field while eliminating the need to have an open flame.
- For small fires, attempt to extinguish fire if you been trained in fire extinguisher use.
- In case of a large fire activate the fire alarm, evacuate the building and alert authorities.

5.0 Release/Leak Procedure

- When a gas leak occurs, personal safety should always come first.
- Alert and clear everyone in the immediate area where the gas leak occurred.
- Avoid breathing gas.
- Know the location and use of fire extinguishers, fire blankets, fire exits
- Know the emergency evacuation signals and procedure

6.0 References and Additional Resources

- https://www.jove.com/v/5035/introduction-to-the-bunsen-burner