









Guide for Bunsen burner use

Bunsen burners may be used in laboratories to heat samples or to boil water rapidly. A well-adjusted flame will have two distinct cones: an outer aqua cone and an inner blue cone. The temperature of the hottest part of the flame, the tip of the inner blue cone, is about 1200 °C. Take a moment to look at the burner. You will see a barrel with a removable tip at one end and a band of holes at the other end. These holes adjust the amount of air entering the barrel (a mixing chamber for fuel and air). On the bottom is a needle valve, which, when turned tight into the barrel, blocks all gas from entering the barrel. Before using a Bunsen burner, check the hose for cracks, and ask your instructor to replace a faulty hose. Use only hoses approved for Bunsen burners and strikers designed specifically for lighting them. Use a Bunsen burner when there is **at least 12 inches of overhead clearance**. In other words, do not use it under a shelf, light fixture or other equipment unless there is at least 12 inches of space. The heat from the flame could ignite nearby objects, especially if those objects are within 12 inches from the Bunsen burner. Before using a flame, tie back loose hair and remove or confine scarves. If you do not know how to adjust the burner, ask your supervisor for instructions.

Please Note: Heat sources such as Bunsen burners are strictly prohibited inside the BSCs as they significantly disrupt the laminar flow of air. Additionally, the flame and heat can damage the HEPA filter inside the cabinet.

Description of work:		Using a Bunsen/Meker burner				
		<p>Potential hazards: Fire hazard with the potential to cause harm through exposure to heat, explosions, sparks, fumes and flame.</p>				
Personal protective equipment, or PPE, required (Check the box for required PPE):						
 Gloves	 Face masks	 Eye protection	 Welding mask	 Appropriate footwear	 Hearing protection	 Protective clothing
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Safe work procedure checklist:

1. Pre-operation/task:

1. Ensure task (e.g., Drawings, instructions, specifications etc.) is clearly understood.
2. Ensure the work area is clean and clear of grease, oil, papers, notebooks, excess chemicals and any other flammable materials.
3. Use a Bunsen burner when there is at least 12 inches of overhead clearance. In other words, do not use it under a shelf, light fixture or other equipment unless there is at least 12 inches of space. The heat from the flame could ignite nearby objects, especially if those objects are within 12 inches from the Bunsen burner
4. Place the Bunsen burner away from any overhead shelving, equipment or light fixtures.
5. 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.
6. Replace all hoses found to have a defect before using.
7. Ensure all fittings are tight and the gas hose is in good condition.
8. Ensure appropriate PPE is worn.
9. Tie back any long hair, dangling jewelry or loose clothing.
10. Use the fume cupboard if undertaking experiments which produce fumes.
11. Notify others in the laboratory that burner will be in use.
12. **Do not** use a Bunsen burner in biological safety cabinet.
13. Immediately report any gas leaks to your supervisor and EHS.

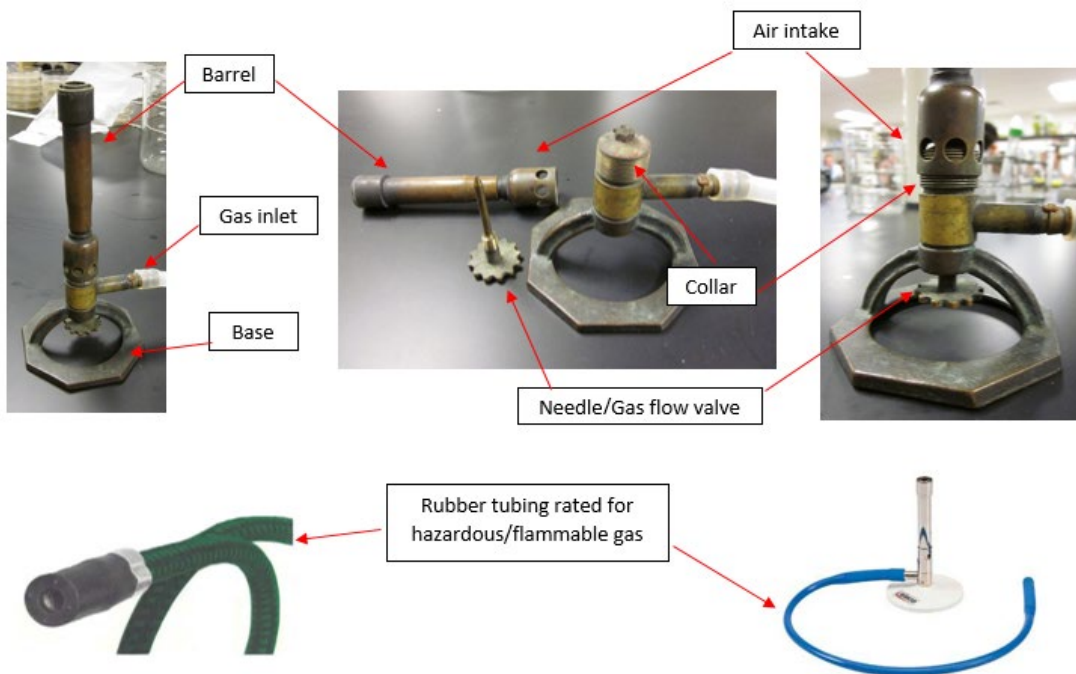
2. Operation/task:

1. Utilize a sparker/lighter with extended nozzle to ignite the Bunsen burner. **Never use a match to ignite burner.**
2. Have the sparker/lighter available before turning on gas.
3. Adjust the flame by turning the collar to regulate airflow and produce an appropriate flame for the experiment (typically a medium blue flame).
4. Turn adjustable opening so the flame turns to blue when in use.
5. Turn adjustable opening so the flame turns to orange when not in use.
6. **Never** leave the Bunsen/Meker burner running unattended.
7. Wait for instruments and burner to cool prior to handling.

3. Post-operation/task:

1. Shut-off gas when its use is complete.
2. Allow the burner to cool before handling.
3. Ensure that the main gas valve is off before leaving the laboratory.
4. Clean and return all materials to storage area.
5. Report any breakages or incidents immediately.

Components of a Bunsen burner:



Bunsen burner safe operating procedure:

1. To use a Bunsen burner, first make sure the collar, barrel and needle are correctly attached to the base and that the collar is closed.
2. To ensure that you have the hottest, cleanest flame possible, make sure your rubber tubing is securely connected to the gas jet and to the gas inlet valve. Inspect the tubing for cracks, holes or other signs of wear.
3. A heatproof mat can be placed under the Bunsen burner as an extra safety precaution to prevent damage to your bench top and to catch stray sparks.
4. Before lighting, place the Bunsen burner at least 12 inches in front of any overhead shelving or equipment. Always keep safety equipment, like fire extinguishers and safety blankets, close at hand. If present, know the location of the emergency gas shutoff switch.
5. Then fully open the gas jet. Use a spark lighter to light the flame. Never use a match or lighter.
6. With the collar fully closed, the "safety flame" - a brighter, dirty, less intense flame - will appear. This flame is cooler and is generally used to indicate that the burner is "on". The safety flame doesn't burn as hot, because with the collar closed, there is minimal airflow through the burner tube, resulting in an incomplete combustion reaction.
7. Now begin turning the collar counterclockwise. As the collar opens, two distinctive flames appear. The blue outer flame is hotter than the safety flame and makes no noise. This flame can be difficult to see, so be careful when the burner is in this state.
8. The blue inner flame burns the hottest, particularly at the tip. In addition to being the hottest flame, it is also the cleanest and loudest flame, making a kind of "roaring" sound.

9. Once you have adjusted the collar to get the flame at the desired temperature, open or close the needle valve to increase the size of the flame or close it to make it smaller. Never leave a lit burner unattended.
10. When your work is done, remember to turn off the gas.
11. Allow burner to cool before handling or put into storage.

Questions? Contact ASU Environmental Health and Safety
at 480-965-1823 or email asuehs@asu.edu.

Revision date 11/17/2021