

# EXPERIMENT

## AIM

To cut a glass tube or rod of a required length and round off its edges.

## MATERIAL REQUIRED

Glass tube or rod, triangular file, Bunsen Burner

## PROCEDURE

Cutting a glass tube is primarily required for making U-shaped tubes, delivery tubes and other purposes. Hence a student must know how-to cut-glass tubes of the required length for specified purposes without injuring their hands.

For cutting a glass tubing, proceed in the following manner.

- (i) Select a glass tubing free of cracks.
- (ii) Place it on the bench, hold it firmly and make a single deep scratch with a triangular file. Do not apply too much pressure.
- (iii) Place the thumbs on each side of the scratch at equal distances from it. Apply gentle pressure and give a quick bending motion towards you until it breaks smoothly (Fig.1)

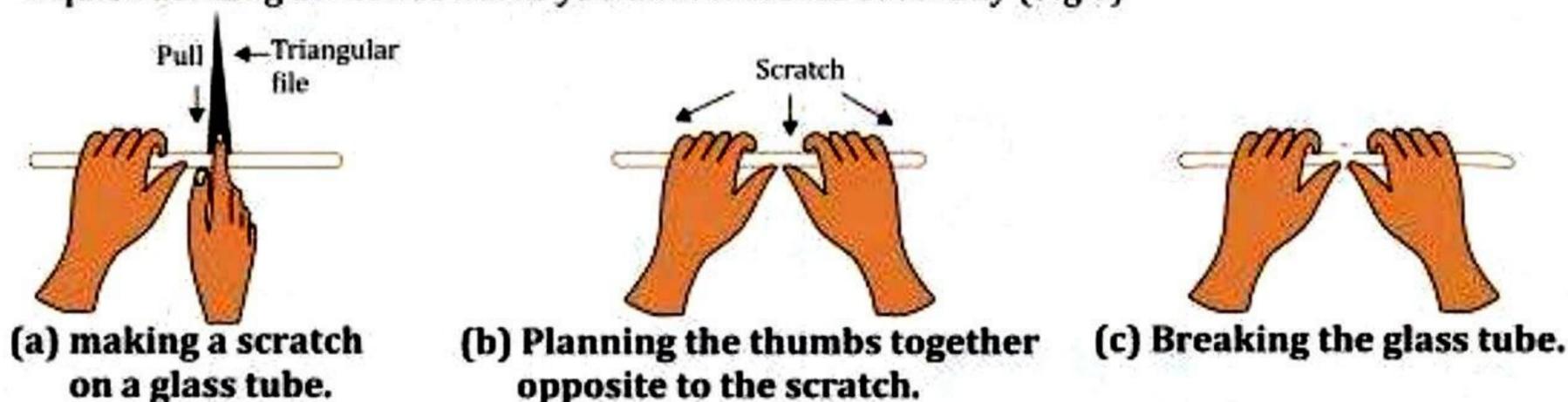


Fig. 1

- (iv) Sometimes, the ends of the tube are not smooth and might bruise your fingers. These can be further smoothed by rotating the ends in a flame for 2-3 minutes. The edges will be smoothed (Fig.2). Allow it to cool while holding it in your hand.

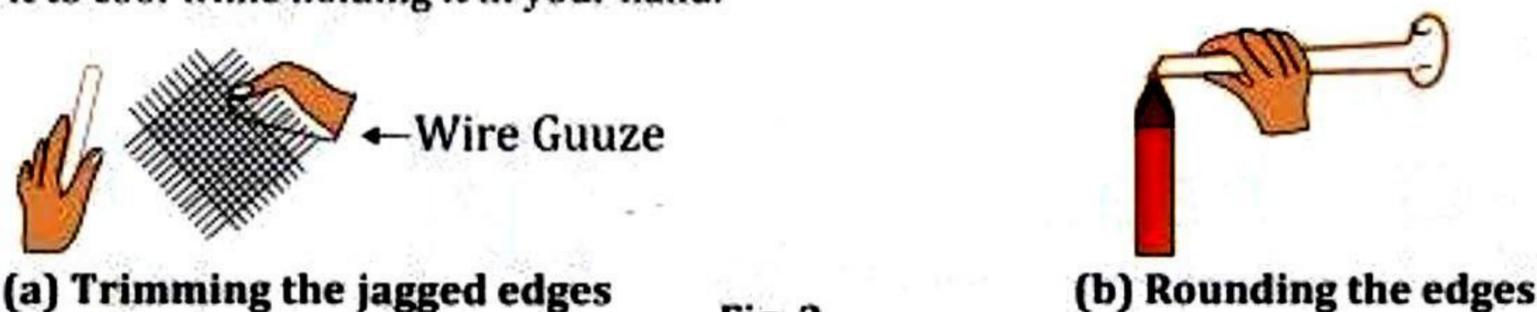


Fig. 2

## PRECAUTIONS

- (i) Make a single deep scratch at the desired length with one stroke of the file.
- (ii) To avoid injury, hold the glass tube with the help of a thick piece of cloth.
- (iii) Do not heat the end for a long time. It may seal the end or make it narrower.

## VIVA VOCE

- Q 1. What safety precautions should be taken before cutting a glass tube or rod?**  
**Ans.** Safety goggles, gloves, and a lab coat should be worn to protect the eyes, hands, and body from glass shards. Also, make sure the work area is clean and free of any obstacles.
- Q 2. What tools are required for cutting a glass tube or rod?**  
**Ans.** A glass cutter or diamond scribe, a file, sandpaper, and a ruler are essential tools for cutting and rounding off the edges of a glass tube or rod.
- Q 3. Why is it necessary to score the glass before cutting?**  
**Ans.** Scoring the glass creates a weak point along which the tube or rod can be cleanly broken, ensuring a precise cut without shattering the glass.
- Q 4. How can you ensure a straight cut when using a glass cutter?**  
**Ans.** Hold the glass cutter firmly against a straightedge or ruler, and apply consistent pressure while scoring the glass to ensure a straight and even cut.
- Q 5. What technique should be used to round off the edges of the glass tube or rod?**  
**Ans.** Use a file or sandpaper to carefully smooth and round off the sharp edges of the glass to prevent injury and create a finished look.
- Q 6. What factors might affect the quality of the cut glass?**  
**Ans.** Factors such as the pressure applied while scoring, the sharpness of the cutting tool, and the type of glass being cut can all affect the quality of the cut.
- Q 7. How can you determine the required length of the glass tube or rod?**  
**Ans.** Measure the desired length using a ruler or measuring tape, and mark the glass accordingly before cutting to ensure accuracy.
- Q 8. What type of glass is most suitable for this experiment?**  
**Ans.** Borosilicate glass is commonly used in laboratory settings due to its durability and resistance to thermal shock, making it ideal for cutting and handling.
- Q 9. What should be done if the glass tube or rod does not break cleanly along the scored line?**  
**Ans.** Use gentle pressure to apply force along the scored line or use pliers to break off any remaining pieces of glass, taking care to avoid injury.
- Q 10. How can you verify the accuracy of the cut glass?**  
**Ans.** Measure the length of the cut glass using a ruler or measuring tape to ensure it matches the desired length, and visually inspect the edges for smoothness and uniformity.