EXPERIMENT

Aim

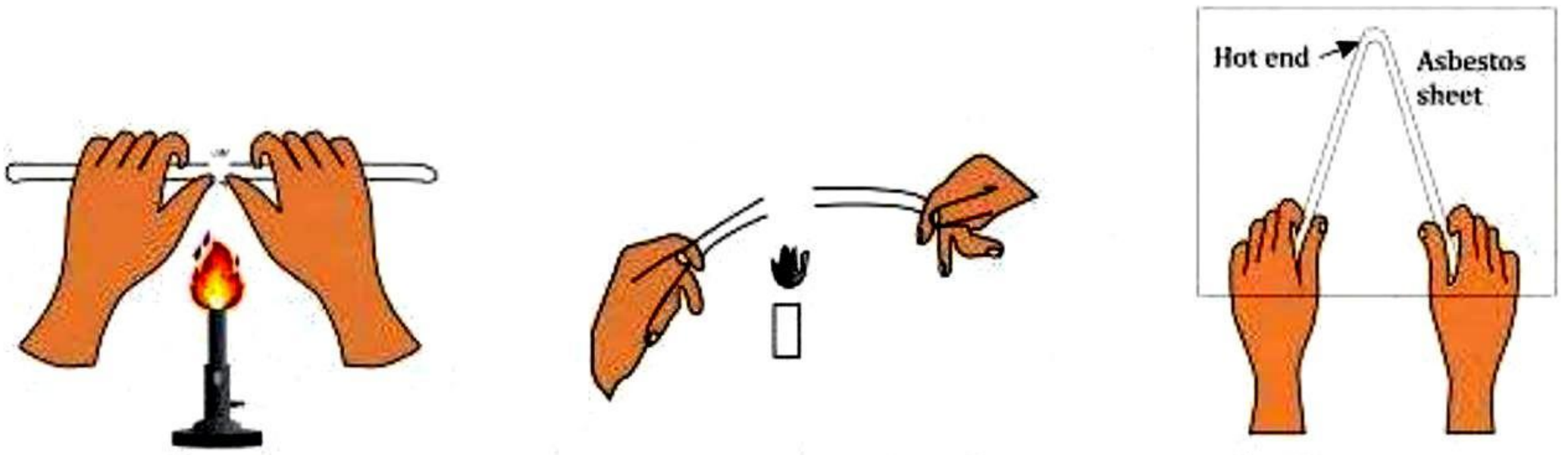
To bend a glass tube at a given angle

MATERIAL REQUIRED

Glass tubing, Bunsen Burner, asbestos

PROCEDURE

For bending a glass tube proceed as follows.



(a) Heating the tube **(b) The tube softens and starts bending under its weight** **(c) Making the bend coplanar**

Fig. 1

(i) Hold the glass tubing between the thumb and fingers and introduce it lengthwise in the luminous flame of the Burner. Keep the tube rotating till it softens. (Fig. 1)

(ii) Now apply gentle pressure so that it bends by its weight. When the desired angle is formed, remove the tubing from the flame.

(iii) Place the bent limb on the asbestos sheet. Press it gently to make it coplanar.

(iv) Allow the tubing to cool.

PRECAUTIONS

(i) Select a glass tube of sufficient length to keep your hands safe from the heat. Do not try to bend very small glass tubes of lengths less than 20 cm.

(ii) While heating, the glass tube should be rotated to ensure uniform heating.

(iii) Never bend the glass tubing by force. By doing so, the tubing may break.

VIVA VOCE

Q 1. What is the purpose of bending a glass tube at a given angle in chemistry experiments?

Ans. Bending a glass tube allows for the creation of specialized apparatus needed for various experiments, such as distillation setups, reflux condensers, and gas collection apparatus.

Q 2. Describe the process of bending a glass tube.

Ans. The process involves heating a portion of the glass tube evenly using a Bunsen burner or a glass-blowing torch until it becomes soft and malleable. Then, the tube is carefully bent to the desired angle using appropriate bending tools or molds.

Q 3. Why is it important to heat the glass tube evenly during bending?

Ans. Heating the glass tube evenly ensures uniform softening of the glass, preventing the formation of weak spots or stress points that could lead to breakage during bending.

Q 4. What safety precautions should be taken when bending glass tubes?

Ans. Safety precautions include wearing heat-resistant gloves and protective eyewear, working in a well-ventilated area to avoid inhalation of fumes, and using proper heating equipment to minimize the risk of burns or accidents.

Q 5. How can the angle of the bend be controlled during the glass tube bending process?

Ans. The angle of the bend can be controlled by adjusting the position and pressure applied during bending, as well as using guides or molds to achieve the desired angle.

Q 6. What factors might affect the success of glass tube bending?

Ans. Factors such as the type of glass used, the thickness of the tube, the heating rate, and the skill of the operator can all affect the success of the bending process.

Q 7. Can glass tubes be bent multiple times?

Ans. Yes, glass tubes can be bent multiple times if necessary. However, each bending process introduces stress into the glass, so repeated bending should be minimized to prevent breakage.

Q 8. What are some common applications of bent glass tubes in chemistry experiments?

Ans. Bent glass tubes are commonly used to create apparatus such as condensers, distillation heads, gas delivery tubes, and reflux setups in various chemical reactions and laboratory procedures.

Q 9. How can the quality of a bent glass tube be assessed after bending?

Ans. The quality of a bent glass tube can be assessed by inspecting it for any cracks, irregularities, or deformities that may affect its functionality. Additionally, the angle of the bend can be measured using a protractor or other measuring tools.

Q 10. Are there alternative methods for bending glass tubes besides using heat?

Ans. Yes, there are alternative methods such as mechanical bending using specialized tools or molds, or chemical methods involving the use of corrosive substances to weaken the glass at specific points. However, these methods may not be as precise or widely used as heating.