EXPERIMENT

Aim

To bore a hole in the cork.

MATERIAL REQUIRED

A cork, Cork borer, glass tubing, and cork pressure, if available

PROCEDURE

Boring a cork is required for setting up an apparatus for the preparation of gas and for carrying / out distillation etc. Above all, it is required for fitting up a wash bottle. For perfect boring of the cork, the following steps are involved.

(i) Softening of the cork

It is essential as a cork gets hard on keeping. To soften a cork, wet it with water. When it becomes more flexible and does not crack readily, then press it in a cork-presser which is a mechanical device and if it is not available, simply press the wetted cork under your shoes after wrapping the cork in a piece of paper. (Fig. 1)

Fig. 1 Pressing the cork with the shoe

(ii) Selection of the borer

Choose a borer slightly smaller in diameter than that of the tube to be fitted in the cork. This will ensure tight fitting of the tube. (Fig. 2)

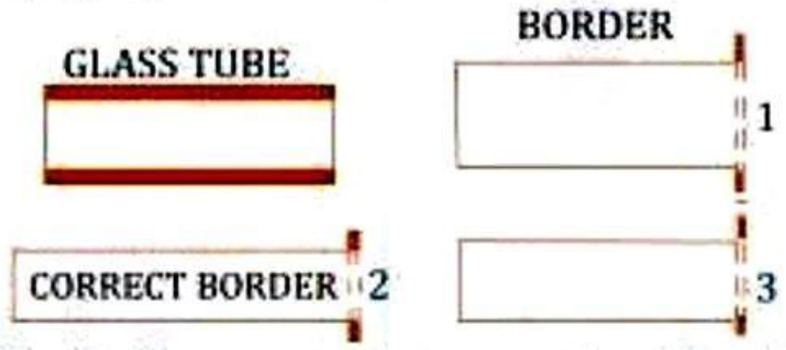


Fig. 2 Proper selection of the borer.

(iii) Boring of the cork

Place the cork on the table with its narrow end upward. Mark the position of the borer on both sides of the cork to ensure a straight hole. Holding the cork 'tightly with your left hand, apply force on the border with a twisting motion. Apply some glycerin to the borer if it is a rubber cork. Glycerin acts as

a lubricant for the hard rubber cork. When half of the cork has been bored, take the borer out and reverse the cork. Start the process of boring taking care that the borer remains vertical throughout. Remove the borer after the cork has been bored from one face to the other. Remove the pieces of the cork inside by inserting the needle. (Fig. 3).

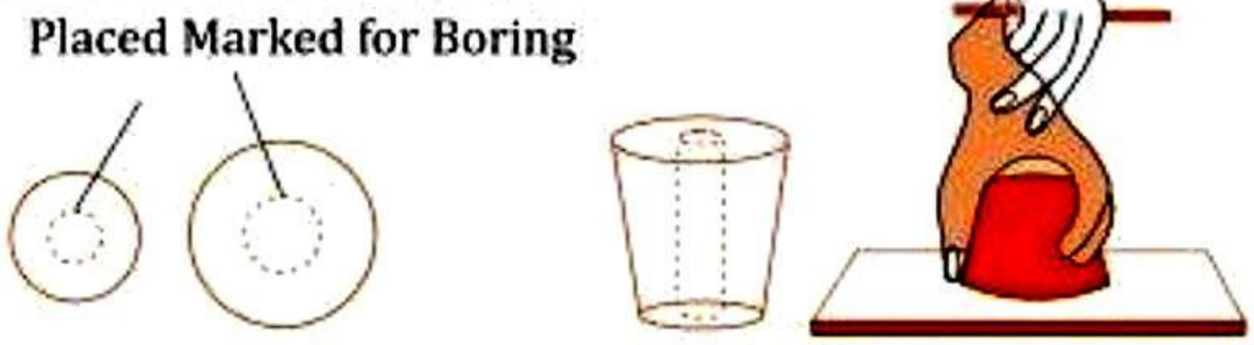
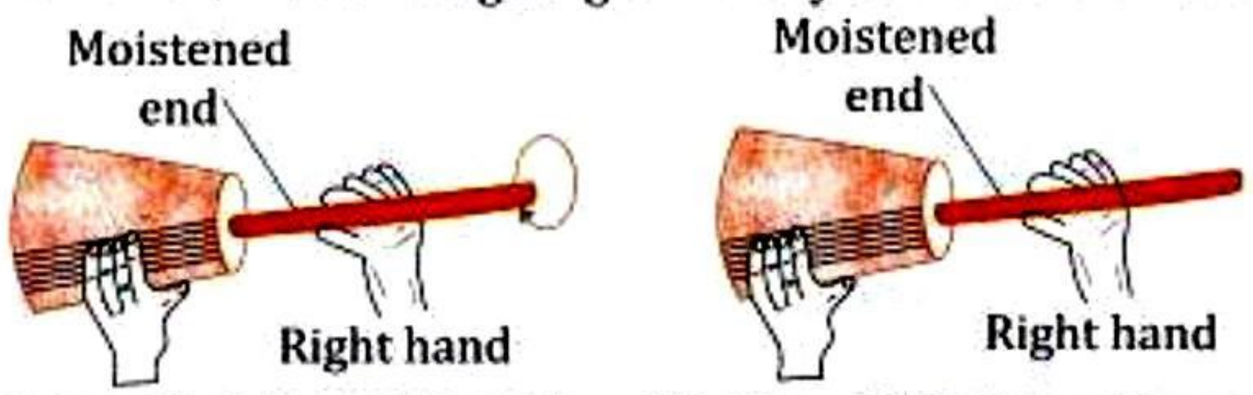


Fig. 3 (a) Marked cork, cork, (b) Boring process

(iv) Fitting the glass tube in the bore

Wet the cork with water. Wet the end of the tube also with water. Hold the cork in one hand say left hand and the tube in the right hand. It should be noted that the tube should be held closely from the wetted end. Insert the tube into the bore giving a rotatory motion as shown in (Fig. 4)



(a) Correct holding of the tube (b) Wrong holding of the tube

Fig. 4 Inserting the tube into the hole of the cork.

PRECAUTIONS

(i) Select bores of a diameter slightly smaller in size than that of the tube to be inserted in the hole.

(ii) Make a mark on both sides of the cork.

(iii) To obtain a smooth hole, drill half the hole from one side and another half from the other side of the cork.

(iv) Since the rubber is hard, the end of the tube' to be inserted is usually dipped in caustic soda solution or glycerin before fitting in the hole.

VIVA VOCE

Q 1. What is the purpose of boring a hole in a cork in chemistry experiments?

Ans. Boring a hole in a cork allows for the insertion of glass tubing, thermometers, or other apparatus into the cork, facilitating the construction of various experimental setups and apparatus.

Q 2. What types of equipment are commonly used to bore holes in corks?

Ans. Cork borers, also known as cork drills or cork borers, are commonly used to bore holes in corks. These tools consist of a cylindrical metal tube with a sharpened cutting edge.

Q 3. How does a cork borer work?

Ans. A cork borer works by rotating the cylindrical cutting edge against the cork while applying downward pressure. This action cuts out a cylindrical plug of cork, leaving behind a hole of the desired diameter.

Q 4. What factors might influence the choice of cork borer size?

Ans. The choice of cork borer size depends on the diameter of the glass tubing or apparatus being inserted into the cork, as well as the size of the cork itself.

Q 5. Why is it important to choose the correct size cork borer for the desired hole diameter?

Ans. Choosing the correct size cork borer ensures a snug fit between the glass tubing or apparatus and the cork, preventing leaks or instability in the experimental setup.

Q 6. Can cork borers be used on other materials besides cork?

Ans. Cork borers are specifically designed for use with cork material due to its soft and porous nature. While they may be used on other soft materials such as rubber stoppers, they may not be suitable for harder materials.

Q 7. What safety precautions should be taken when using cork borers?

Ans. Safety precautions include wearing gloves to protect against accidental cuts, ensuring proper alignment and stability of the cork and cork borer, and avoiding excessive force to prevent injury.

Q 8. Can cork borers be reused, and if so, how should they be cleaned and maintained?

Ans. Yes, cork borers can be reused. They should be cleaned thoroughly after each use to remove any debris or residue, and periodically sharpened to maintain their cutting edge.

Q 9. Are there alternative methods for creating holes in corks besides using cork borers?

Ans. Yes, alternative methods include using hand drills, electric drills, or even sharp knives or scissors to cut holes in corks. However, cork borers provide a precise and efficient method for creating clean, uniform holes.

Q 10. What are some common applications of corks with holes in chemistry experiments?

Ans. Corks with holes are commonly used to seal glassware in various experimental setups, such as distillation apparatus, reflux setups, and gas collection systems, allowing for the controlled flow of gases or liquids.