

OBJECT: TO CARRY OUT SIMPLE GLASS WORKINGS

APPARATUS REQUIRED

1. Long glass tube
2. Scale
3. Triangular file
4. Bunsen Burner
5. Wash bottle

THEORY

Glass is a hard, transparent and brittle **amorphous solid**. It is mainly made up of **silicates and other oxides** of different elements. Unlike crystalline substances, glass does not have a regular arrangement of particles. Its composition can vary because it contains different oxides in different amounts. Therefore, **glass does not have a fixed chemical formula**.

There are different types of glass depending on their composition. **Soda-lime glass (soft glass)** is one of the most common types of glass. It mainly contains **silica (SiO_2)**, **sodium compounds and calcium compounds**. It is widely used for making **glass tubes, laboratory apparatus, bottles, windows and glass sheets**.

One important property of glass is that it **does not have a sharp melting point**. When glass is heated, it gradually becomes soft over a range of temperatures. On further heating, it becomes softer and can be bent or shaped easily. This property makes glass very useful for making different laboratory apparatus.

1. Cutting and rounding glass tubes

Glass tubes used in the laboratory are commonly made of **soda-lime glass**. A glass tube can be cut to the required length by making a **deep scratch around the tube with a triangular file** and then breaking it carefully at the scratched portion.

The cut edges of the tube are **sharp and rough** and may cause injury. Therefore, the edges are heated gently in a **Bunsen burner flame** until they become smooth and rounded.

2. Bending glass tubes

When a glass tube is heated sufficiently, it becomes **soft and flexible**. The softened portion can then be bent carefully into the required shape.

Glass tubes can be bent to form **right, acute or obtuse angles**. Bent glass tubes are commonly used to **connect different pieces of laboratory apparatus** and to carry or transfer liquids and gases.

3. Drawing a jet and capillary tube

Soda-lime glass is suitable for making jets and capillary tubes because it softens easily on heating.

A **glass jet** is a narrow glass tube with a small opening. It can be used to deliver a liquid or gas through a narrow opening.

A **capillary tube** is a very narrow glass tube having a small and nearly uniform diameter. Liquids may rise or fall in a capillary tube due to **capillary action**. Capillary tubes are commonly used in the laboratory for **determining the melting point of substances** and for handling very small amounts of liquids.

4. Fitting a wash bottle

A **wash bottle** is a squeezable bottle fitted with a narrow nozzle. It is usually filled with **distilled water or a suitable cleaning liquid**.

When the bottle is squeezed, the liquid comes out through the nozzle as a controlled stream. It is used for **washing and rinsing laboratory glassware**, such as test tubes, funnels, watch glasses and flasks.

[Remember for the exam

Glass → softens on heating → can be cut, rounded and bent

- **Triangular file** → scratches the glass tube for cutting
- **Bunsen burner** → softens glass and rounds sharp edges
- **Heating + bending** → makes tubes of required angles
- **Soft glass** → suitable for making jets and capillary tubes
- **Capillary tube** → used for melting-point determination
- **Wash bottle** → used for washing laboratory glassware]

PROCEDURE

No need to write. Remember the process to perform in the exam.

RESULT

Write from the book.

PRECAUTIONS

Write from the book (any three)