



1.1. Why are solids rigid?

Ans: The constituent particles in solids have fixed positions and can oscillate about their mean positions. Hence, they are rigid.

1.2. Why do solids have a definite volume?

Ans: The constituent particles of a solid have fixed positions and are not free to move about, i.e., they possess rigidity. That is why they have definite volume.

1.3. Classify the following as amorphous or crystalline solids:

Polyurethane, naphthalene, benzoic acid, teflon, potassium nitrate, cellophane, polyvinyl chloride, fibre glass, copper.

Ans: Crystalline solids: Benzoic acid, potassium nitrate, copper

Amorphous solids: Polyurethane, teflon, cellophane, polyvinylchloride, fibre glass

1.4. Why is glass considered a super cooled liquid?

Ans: Glass is an amorphous solid. Like liquids, it has a tendency to flow, though very slowly. This can be seen from the glass panes of windows or doors of very old buildings which are thicker at the bottom than at the top. Therefore, glass is considered as a super cooled liquid.

1.5. Refractive index of a solid is observed to have the same value along all directions. Comment on the nature of this solid. Would it show cleavage property?

Ans: As the solid has same value of refractive index along all directions, it is isotropic in nature and hence amorphous. Being amorphous solid, it will not show a clean cleavage and when cut, it will break into pieces with irregular surfaces.

1.6. Classify the following solids in different categories based on the nature of intermolecular forces operating in them: Potassium sulphate, tin, benzene, urea, ammonia, water, zinc sulphide, graphite, rubidium, argon, silicon carbide

Ans:

Potassium sulphate = Ionic Tin = Metallic.

Benzene = Molecular (non-polar)

Urea = Molecular (polar).

Ammonia = Molecular (H-bonded)

Water = Molecular (H-bonded)

Zinc sulphide = Ionic

Graphite = Covalent

Rubidium Metallic Argon = Molecular (non-polar)

Silicon Carbide = Covalent

1.7. Solid A is a very hard electrical insulator in solid as well as in molten state and melts at extremely high temperature. What type of solid is it?

Ans: It is a covalent or network solid.

1.8. Ionic solids conduct electricity in molten state but not in solid state. Explain

Ans: In solid state, the ions cannot move, they are held by strong electrostatic forces of attraction. So, ionic solids do not conduct electricity in solid state. However, in the molten state, they

dissociate to give free ions and hence conduct electricity.

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