

Quiz (Simple Molecular Structure)

1. Explain why iodine is a solid, bromine is a liquid, while chlorine and fluorine are gases under room conditions.

(Hint: You may answer the question with reference to the van der Waals' forces between the molecules.)

2. Answer the following questions concerning sulphur.
 - (a) What is the type of bonding between the atoms in a sulphur molecule?
 - (b) What are the attractive forces that hold sulphur molecules together?
 - (c) Is sulphur a high-melting or low-melting solid? Explain briefly.
 - (d) Does sulphur conduct electricity? Explain briefly.
 - (e) Is sulphur soluble in water?

Suggested Answer

1. Iodine, bromine, chlorine and fluorine have simple molecular structures and their molecules are held together by weak intermolecular forces called van der Waals' forces. The larger the molecular size, the stronger are the van der Waals' forces. The molecular sizes of the substances are: $I_2 > Br_2 > Cl_2 > F_2$. Therefore, the strength of the van der Waals' forces are: $I_2 > Br_2 > Cl_2 > F_2$.
2. (a) Covalent bonding
(b) Intermolecular forces / van der Waals' forces
(c) Sulphur is a low-melting solid. This is because it has a simple molecular structure.

Only a small amount of heat energy is needed to separate the molecules during melting.

(d) No. This is because there are no mobile ions or delocalized electrons in the structure.
(e) No