Answer on Question#38538-Chemistry-Inorganic Chemistry

Questions

1. In which reaction can the oxidation properties of S be seen?
2. What are the properties of molecular crystalline lattice?

Answers

1. The oxidation properties of S can be seen in reactions with metals, e.g.:
$S + Na \rightarrow Na_2S$,
$S + Fe \rightarrow FeS$,
or in the reaction with C (graphite):
$S + C \rightarrow CS_2$
The above reactions occur at elevated temperatures.

2. In the molecular lattice the lattice sites are occupied either by atoms - as in solid argon or krypton - or by molecules - as in solid CO_2, SO_2, or H_2O. The particles in the molecular lattice are held together by non-covalent interactions, namely:
- if the lattice contains only individual atoms, as in solid argon or krypton, or if they are composed of non-polar molecules, as in naphthalene, the only attractions between the molecules are the London forces;
- if the lattice contains polar molecules, such as sulphur dioxide, the major forces that hold the particles together are dipole-dipole attractions;
- if the lattice contains very polar molecules, such as water, the primary forces of attractions are hydrogen bonding.

Such solids tend to be soft and have low melting points because the particles in the solid experience relatively weak intermolecular attractions. The crystals are soft because little effort is needed to separate the particles or to move them past each other. The solid melts at low temperatures because the particles need little kinetic energy to break away from the solid.