

Answer on Question #45672 - Chemistry - Inorganic Chemistry

Question

Which is Solid between Silicon Di Oxide(SiO_2) & Carbon Di Oxide(CO_2)? Explain.

Answer:

Silicon and carbon are in the same group in the Periodic table and are expected to show the same properties. But these elements have different atomic radii. Carbon has smaller atomic radius, than silicon, so carbon can easily form double bond with oxygen. That's why each carbon atom in CO_2 molecule is double bonded to two oxygen atoms, so, CO_2 consists of individual molecules and they are free to move, i.e. CO_2 is a gas.

Silicon has bigger atomic radius, so it can form only single bonds with oxygen, not double. Each silicon atom is single bonded to four oxygen atoms and each oxygen atom is single bonded to two silicon atoms. As a result, the particles in SiO_2 are not free to move, and SiO_2 forms a network solid.

So, silicon dioxide (SiO_2) is the solid substance and carbon dioxide (CO_2) is the gaseous substance.

Answer: Silicon dioxide (SiO_2) is the solid substance.