19/MHS02/043

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Chem 102

1. •Diamonds are very hard, graphite is soft and slippery

•Diamond has sp3 with no TT electrons, graphite has sp3 hybridized like benzene with TT electrons

•diamond has a melting point of 3930°C while graphite has 3000°C

•Diamond is tetrahedrally bonded in all directions while graphite is layer structure with fused rings

•Diamonds has a density of 3.51g/cm³ while graphite is 2.22g/cm³

2.•Ionic hydrides: are formed when molecular H2 react alkali and alkaline earth metals. These halides are solid with high melting point temperatures.

•Covalent hydrides: are formed with elements in groups IIA to VIIA. e.g HCl.

•Interstitial hydrides: are the non-stochiometric hydrides usually formed with transitional metals like iron in this case the molecular hydrogen dissolves in metals only to be released on heating

3.•Ionic Crystal's are hard, brittle, high MP and BP, conductors of heat and electricity, electrostatic e.g NaO

•covalent crystals are hard,high MP and BP, poor conductors of heat and electricity, covalent bond e.g SiO2

•molecular Crystals: are soft, low MP &BP, poor conductors of heat and electricity, dipole interaction e.g Ar

• metallic Crystal's: soft to hard,low to high MP&BP, good conductors or heat and electricity, metallic bonds e.g Na

4. •Group 5 element have 5 valence electrons,group 6 elements have 6 electrons in their valence shell and group 7 elements have 7 valence electrons which shows similarities in each group

•elements in group 6 are more electro negative than the nitrogen group elements to their left but less electro negative than the halogen to their right

5. •Normal oxides contain E-m bonds but no E-E bonds these bonds may be ionic or covalent e.g CaO. They are the most important and numerous classes.

•suboxides contain E-E bonds as well as R-O bonds but no O-O bonds e.g carbon suboxide

•Peroxides contain O-O bonds as well as R-O bonds but no E-E bonds e.g K_2O. The oxidation number of oxygen in peroxide is -1.

•Superoxide are related to peroxide. But contain the ion (O^2) in which oxygen has the oxidation number -½ it forms super oxides e.g KO_2

•Normal oxide is the most important class and is divided into sub classes: basic, acidic, atmospheric and neutral oxides depending on their behaviour with water aqueous acid and alkalis.