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- 1 Diamond is hard due to strong covalent bonds present in it.  
In Graphite, carbon atoms are bounded together in a flat layer by a strong covalent bonds in a regular hexagon. These layers are held together by much weaker van der Waals forces, therefore the crystals of graphite are soft and slippery.
- 2a) Ionic Hydrides  
Ionic, or saline, hydride is a hydrogen atom bound to an extremely electropositive metal, generally an alkali metal or an alkaline earth metal (eg) Potassium hydride).
- 2b) Covalent Hydrides  
Covalent hydrides refer to hydrogen centers that react as hydrides, or those that are nucleophilic in these substances, the hydride bond, formally is a covalent bond much like the bond that is made by a proton in a weak acid. This category includes hydrides that exist as discrete molecules, polymers, oligomers.
- 2c) Interstitial or metallic hydrides.  
Interstitial hydrides most commonly exist within metals or alloys. Their bonding is generally considered metallic. Such bulky transition metals form interstitial binary hydrides when exposed to hydrogen.
- 3i) Ionic crystal  
Consist of positive and negative ions as NaCl
- ii) Covalent network crystals  
Consists of atoms covalently bonded as diamond, SiO<sub>2</sub>
- iii) Metallic crystals  
Consists of metal cation
- iv) Consist of covalently bonded molecules held by intermolecular forces.
- 4 Similarities and differences group 5, 6, and 7 in the periodic table

#### **SIMILARITIES**

1 Both group 5,6, and 7 have high melting points

2 Both 5,6, and 7 has electro negativity

#### DIFFERENCES

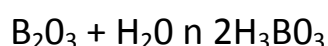
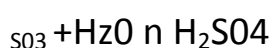
1 Group 5 are reactive metal with a high melting point while 6 and 7 are non-reactive metals with high melting point.

2 Group 5 and 6 belongs to a class of transition metals why group 7 belongs to the halogen class.

5i) Acidic Oxide

Non-metals react with oxygen to form acidic compounds of oxides which are held together by covalent bonds. Also called anhydrides

E.g  $\text{CO}_2$



ii) Basic Oxide

Metals react with oxygen to give basic compounds of oxygen. These compounds are ionic in nature. Eg  $\text{M}_2\text{O}_3$ ,  $\text{MO}_2$



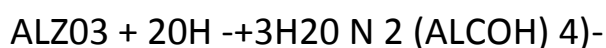
iii) Amphoteric Oxide

are compound of oxygen that exhibits both acidic and basic characteristics. Eg:  $\text{Al}_2\text{O}_3$

Acidic characteristics:



Basic characteristics



iv) Neutral Oxides

are compound react with oxygen to form oxide which do not exhibit acidic or basic characteristics

Example:  $\text{NO}$ ,  $\text{CO}$