Chemistry - 11th Class Chemistry Short Questions Chapter 6 Preparation

Q1. **Why MOT is superior to VBT?**

Ans 1: Molecular orbital theory tells us the reason for no bond between noble gases. It also tells us the number of bonds whether sigma or pi in N_2 and O_2. Moreover it tells about the paramagnetic and diamagnetic nature of the substance, but V.B.T. does not given such answers.

Q2. **Why the electron affinities of II-A are less then those of I-A?**

Ans 1: The elements of II-A have fulfilled outermost s-orbitals, so electron has to be accommodated in the higher orbitals. Their electron affinities are positive. The elements of I-A can accommodate incoming electron in partially filled s-orbital.

Q3. **Ionization energy of the element is the binding energy of the nucleus and the electron. Why is it measured when the atom is in the gaseous state?**

Ans 1: The outermost electrons are attracted by the nucleus. If the atom is closer to some other atom of its own kind or of different kinds, then the outermost electrons are being attracted or repelled by other species as well. In that situation, it is not possible to guess the forces of attractions within the nucleus and the outermost electron.

Q4.

Why the bond angles of H_2O and NH_3 are not 109.5° like that of CH_4, although O and N-atoms are sp^3 —hybridized?

Ans 1:

Like CH_4, the molecules of H_2O and NH_3 are also AB_4 type molecules. Carbon, oxygen and nitrogen atoms undergo sp^3 -hybridization. CH_4 is perfectly tetrahedral with the angle of 109.5°. In case of ammonia, there are three bond pairs and one lone pair. Lone pair-bond pair repulsion is greater than bond pair-bond pair repulsion. Due to this reason, angle reduces to 107.5° In case of H_2O, there are two lone pairs on oxygen. Due to this increased repulsion of two lone pairs, the angle further reduces to 104.5°

Q5. **How does the electronegativity difference decide the nature of ionic bond?**

Ans 1: When the electronegativity difference between two bonded atoms is 1.7 or more than that, then the bond is said to be ionic, otherwise covalent. The % age of ionic character is more than 51% when the electronegativity difference is 1.7.

Q6. **How the %age of ionic character of the polar bond can be determined?**

Ans 1:

Q7. **Dipole moment of CO_2 is zero but that of CO is 0.12 Debye. Why?**

Ans 1: CO_2 is linear molecule and the two dipoles cancel the effect of each other. In CO there is a single dipole directed from carbon to oxygen and it not cancelled.

Q8. **How do you justify that all the bonds between I-A and II-A with VI-A and VII-A are not equally ionic?**

Ans 1: The I.E. values of the I-A are less than II-A and the E.A. of VII-A are greater than VI-A. So, the bond between IA and VII-A should be ionic to a good extent. The bonds between II-A and VI-A should be poorly ionic. It means that all the above mentioned compounds are not equally ionic.

Q9.

Why the atomic radii increase down the group?

Ans 1: The number of shells increase along with the increasing shielding effect down the group. These two factors are dominant in increasing the sizes. no doubt, the nuclear charges are increased, but this is not a dominant factor.

Q10.

Ans 1:
