ASSIGNMENT-1

NUMERICAL QUESTIONS:

**Q.1** Calculate the electronegativity of fluorine from the following data:

E_{H-H}=104.2 kcal mol^{-1}, E_{F-F}= 36.6 kcal mol^{-1}

E_{H-F} = 134.6 kcal mol^{-1}, X_H =2.1.

Q.2 In the ionic compound KF, the K^+ and F^- ions are found to have practically identical radii, about 1.34 Å each. What do you predict about the relative covalent radii of K and F?

Q.3 The IE values of $Al_{(g)} \rightarrow Al^+ +e$ is 577.5kJmol^{-1} and ΔH for $Al_{(g)} \rightarrow Al^{+3}_{(g)}$+3e is 5140 kJ mol^{-1}. If second and third IE values are in the ratio 2 : 3. Calculate IE_2 and IE_3.

Q.4 How many chlorine atoms will be ionised $Cl \rightarrow Cl^+ + e^{-1}$ by the energy released from the process $Cl + e^{-1} \rightarrow Cl^-$ for 6.02×10^{23} atoms (I.P. for Cl = 1250 kJ mole^{-1} and E.A. = 350 kJ mole^{-1})

Q.5 For the gaseous reaction,

$K + F \rightarrow K^+_{(g)} + F^-_{(g)}$, ΔH was calculated to be 19 kcal under conditions where the cations and anions were prevented by electrostatic separation from combining with each other. The ionisation potential of K is 4.3 eV. What is the electron affinity of F?

Q.6 The crystal structure of LiI and KI are shown below
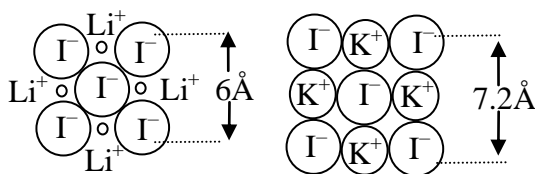
Determine the radius of K^+ in pm in nearest possible integers.

Q.7 As per pauling the radius of the isoelectronic ions in a given crystal is inversely proportional to the effective nuclear charge, Z*.

Z* = Z – σ ; where σ represent the screening constant

Crystal structure of NaF is shown as below
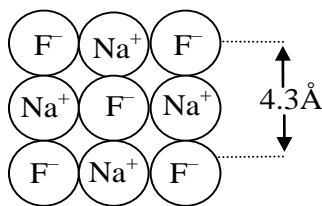
Determine the radius of F^- in pm in nearest possible integer.

Q.8 Given : $\dfrac{1}{2}$ H$_2$ (g) $\longrightarrow$ H (g) ΔH = 50 kcal/mole

PH$_3$ (g) $\longrightarrow$ P (g) + 3H (g) ΔH = 243 kcal/mole

Determine P-P bond dissociation energy in kcal/mole in nearest possible integers in kcal / mol

Q.9 Ionisation potential and electron affinity of fluorine are 17.42 eV and 3.48 eV respectively. Determine the electronegativity of fluorine on Mlliken scale.