Name: Kobilov Ilkhomjon

Student: 2019232 50

Question 1

a) $P_1V_1 = P_2V_2$ $\quad V_1 = 100\ L$

$P_1 = 15.0\ atm$ $\quad P_2 = 2.00\ atm$

$$V_2 = \frac{P_1V_1}{P_2} = \frac{15.0\ atm \times 10.0\ L}{2.00\ atm} = 75.0\ L$$

$\Delta V = 75L - 10.0\ L = 65.0\ L$ $\quad W = -P\Delta V$

$W = -2.00\ atm \times 65.0\ L = -130\ L$

$$= -130\ L\text{-}atm \times \left(\frac{101.3\ J}{1\ L\text{-}atm}\right) = \underline{-13.2\ kJ}$$

b) Heat energy can't be created or destroyed It can however, be transferred from one location to another and converted to and from other forms of energy. The heat of eny reaction ΔH_f° for a specific reaction is equal to the sum of the heats of reation for any set of reactions which in sum are equal to the overall reaction

Question 1 b) continuation

$$ClF_{(g)} + \frac{1}{2}O_2(g) \longrightarrow \frac{1}{2}Cl_2O + \frac{1}{2}F_2O \qquad \Delta H = 83.7\ kJ$$

$$\frac{1}{2}Cl_2O(g) + \frac{3}{2}F_2O_{(g)} \longrightarrow ClF_{3(g)} + O_{2(g)} \qquad \Delta H = -170.7\ kJ$$

$$F_{2(g)} + \frac{1}{2}O_{2(g)} \longrightarrow F_2O_{(g)} \qquad \Delta H = -21.7\ kJ$$

$$\Delta H = 83.7\ kJ - 170.7\ kJ - 21.7\ kJ = -108.7\ kJ$$

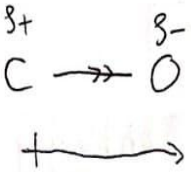
(ΔH) $ClF_{(g)} + F_{2(g)} \rightarrow ClF_{3(g)} \qquad \Delta H = -108.7\ kJ$

Question 2

a) C-O

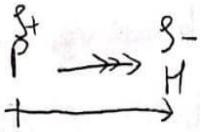
Electro negativity of O = 3.44

Electro negativity of C = 2.55



P-H Electro negativity of P = 2.19

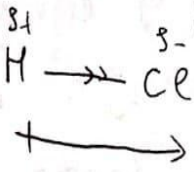
Electro negativity of H = 2.20



H will get negative charge

H-Cl EN of H = 2.20

EN of Cl = 3.16

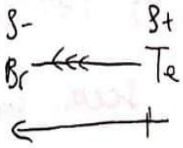


Se-S EN of Se = 2.55

EN of S = 2.58

Br-Te EN of Br = 2.96

EN of Te = 2.1



Polarization

it remains non-polar

Question 2

B) MgO doesnot exist as $Mg^{+}O^{-}$ because O requires ~~e~~ 2 to complete the octet and it has to satisfy the bond theory.

To ionize Mg to Mg^{2+} is about 2 times and O_2^- provides about endothermic reaction due to entropy phenomena. So MgO exists as $Mg^{2+}O^{2-}$

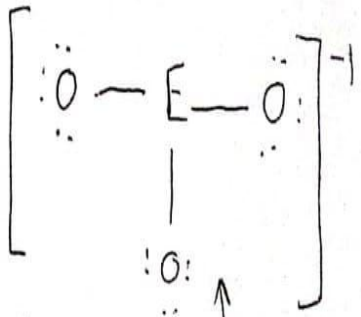
Question 3

Total valance electrons = 26 e^-

negative charge correspondent = 6 e^- total 18 e^-, 8 e^-

unknown element = 7 e^-

X (X = F, Cl, Br, I)



Electron pair geometry is tetrahedral.

Shape is distorted to pyramidal.

This causes to have molecular structure to be Trigonal pyramidal

Bond angle = $\boxed{< 109.5^\circ}$

Question 4

$C = kP \qquad P = 0.79$

$C = 8.21 \times 10^{-4}$

$8.21 \times 10^{-4} = k \times 0.79$

$\boxed{k = 1.03 \times 10^{-3}}$

$C = kP \qquad P = 1.1\ atm$

$C = 1.03 \times 10^{-3} \times 1.1 = \underline{1.14 \times 10^{-3}\ mol/L}$

Student ID : 201923250
Name : KOBILOV ILKHOMJON