Home assignment - 2020
Class - TDC Second Semester (Generic)
Subject :- Chemistry

H.A-1

1. State the postulates of kinetic theory of gas. From these postulates of kinetic theory derive the Kinetic gas equation $pV = \frac{1}{3} m N \bar{c}^2$

Where p = Pressure of the gas
V = Volume of the gas
m = mass of single molecule of gas
N = Total number of gas molecules present in the container
$\bar{c}$ = Root mean square speed of the molecules.

Home assignment - 2020

Class :- TDC Second semester (Major)

Subject :- Chemistry

HA-1

1. Define following thermodynamic terms

(a) System (b) Surrounding (c) open system (d) closed system

(e) Isolated system (f) State function (g) Path function

(h) Extensive property (i) ~~isolated~~ Intensive property.

2. write Zeroth Law of thermodynamics and first law of thermodynamics and its mathematical formulation.

3. One mole of oxygen at 300 K expands isothermally from 3 Nm^{-2} to 1 Nm^{-2}. Assume that oxygen behaves ideally Calculate W, if the expansion is (i) reversible and ii) Single Step against a constant pressure of 1 atmosphere.

HA-2

1. Define following terms associated with thermochemistry

a) Heat of reaction (b) Standard state (c) Enthalpy of formation of molecules (d) Enthalpy of formation of ions.

(e) Enthalpy of combustion (f) Bond energy (g) Resonance energy

2. What do you mean by degree of freedom of a molecule. State the law of equipartition of energy. (a) Express total energy of one mole CO_2 molecules using this principle.

3. From the following thermochemical reactions, Calculate the enthalpy change for the reaction $3C_2H_2(g) \rightarrow C_6H_6(l)$ at 298K

(i) $C_6H_6(l) + \frac{15}{2}O_2(g) = 3H_2O(l) + 6CO_2(g)$ $\quad \Delta H_1^0 = -3267.70\ KJ$

(ii) $C_2H_2(g) + \frac{5}{2}O_2(g) = 2CO_2(g) + H_2O(l)$ $\quad \Delta H_2^0 = -1299.55\ KJ$