PHYSICAL CHEMISTRY

ONLINE LECTURE(II SEM)

NO. 1

DATE:- 27 MARCH, 2020

TIME: (9.00A.M.)

Chapter 1: The Gaseous State (L: 14, M: 19)

The kinetic theory of ideal gases. Assumptions of kinetic theory of gases. Kinetic gas equation and its Significance (Derivation not expected), Deductions of Avogadro's principle, Graham's law, kinetic energy of translation. Deviation of real gases from ideal behavior. Reasons for deviation, compressibility factor, Van der Waal's equation, its applications. Andrew's isotherms of CO2, relation between critical constants and Van der Waal's constants, liquification of Gases, Joule Thomson effect, related numerical.

Chapter 2: Liquid State (L: 06, M: 08)

Introduction, Surface tension of liquid, units of surface tension, factors affecting surface tension, determination of surface tension of liquids by single capillary method and stalagnometer method. Viscosity of liquid, units of viscosity, measurement of viscosity of liquid by Ostwald's method, related numerical.

Chapter 3: Second Law of Thermodynamics (L: 10, M: 13)

Introduction, Limitations of first law of thermodynamics, spontaneous and non spontaneous process with examples, Statements of second law of thermodynamics, entropy, entropy changes in isolated systems, entropy changes for systems only, entropy of mixing of gases, entropy changes in ideal gases and physical transformation, Numerical.

1.1: - Assumptions of Kinetic theory of gases: -

1) Every gas consists of extremely small discrete particles called as molecules. Exception is of inert gases.

2) The molecules of the same gas have the same properties, while the molecules of different gases have different properties.

3) There are no intermolecular attraction forces between gas molecules.

4) The volume occupied by the single molecule is negligible as compared with the total volume occupied by the gas.

5) The molecules of a gas are in a state of constant rapid motion in all possible directions. The molecules travels in straight lines and on collision with another molecule or with the walls of the container, the direction of motion is changed.

6) The pressure exerted by a gas is because of the continuous bombardment of the molecules against the walls of the container. The magnitude of this pressure is dependent upon the kinetic energy of the molecules and their number.

7) No energy is lost by the gas molecules during collisions. i.e. The collisions are perfectly elastic.

8) The motion imparted to the molecules by gravity is negligible in comparison with the effect of the continued collisions between them.

9) The average kinetic energy of all the gas molecules is directly proportional to the absolute temperature.

Thank You.

Stay Home, Stay Safe.