SRM INSTITUTE OF SCIENCE & TECHNOLOGY (Deemed to be University u/s 3 of UGC Act, 1956)

REG. NO.

DATE Dr. John Bosco

NAME Chemistry Notes.

DEGREE

SPECIALISATION

COURSE

SEMESTER

Module No3:- 27-SL02.

Critical phenomena.

* The most important characteristic property of a gases is that their molecules lie part from one another and is a continous rapid motion.

* Each molecule therefore leads almost an independent existence. This is particularly happens when the temperature is high and the pressure gets low.

* When the temperature of the gas gets evolved or, lowered the kinetic energy of the molecule gets decreases. Increase of pressure and decrease of temperature both tends to cause liquification of gases.

K.E of the gaseous molecule is =

No Additional Sheets will be issued

Assignment-7

For example Sulphur dioxide can be liquified at -18°c if the pressure is 1 atm. But it can be liquified even at high temperature of 20°c if the pressure is increased to 3.24 atm.

Critical Temperature:-

The effect of temperature however is more important than that of the pressure because for each gas there is a certain temperature above which it cannot be liquified. No matter how high pressure is applied. This temperature is called critical temperature.

In general the critical temperature of a gas may be defined as that temperature above which it cannot be liquified called critical temperature.

Critical pressure:- At critical temperature there is some pressure required to liquefy the gases. This pressure is called as the Critical pressure. For Instance at 31.1°c Carbondioxide can be liquified under pressure of 72.9 atm. Thus the critical pressure of the gas is 72.9 atm pressure.

Critical Volume:-

The volume occupied by one mole of a gas at its critical temperature and critical pressure is known as Critical Volume.

For example the critical volume of CO_2, Oxygen and hydrogen are 94.0, 74.2 and 65.5 ml per mole respectively.

Module No:-3 : S2-S1.

X-ray diffraction studies:

Solids are broadly classified into two types

1) A crystalline solid also called true solid
2) An Amphorous solid

A crystalline solid exists as a small crystals each crystal having a characteristic geometrical shape

In a crystal the atoms molecules or ions are arranged in a regular shape repeating three dimensional pattern called the crystal lattice

Amphorous solids [No form]

Atoms/molecules (or) Ions are arranged at random and lacks the ordered crystalline lattice

Examples

Rubber, plastics, Glass, fiber these are amphorous solids.

lattice point:

A regular infinite arrangement of points in which every point has the same environment as any other point is known lattice point.

Space lattice

The constituent particles of a crystalline solid are arranged in a definite fashion in the three dimensional space are called space lattice

[The arrangement of crystal points in a 3D-space arrangement are space lattice].

Unit cell A Unit cell is a three dimensional space portion of a Complete space lattice which when repeated

over and over again in different directions produces the complete space lattice.

The size and shape of the Unit cell is determined by the length of the edges of the Unit cell [a, b and c] and by the angles [α, β and γ] between the edges respectively.