GOEL INSTITUTE OF PHARMACY AND SCIENCES (0392)

ASSIGNMENT I

PHYSICAL PHARMACEUTICS (BP302T)

SESSION (2022-2023)

5/5

SUBMITTED BY

Priya Pwari

B. Pharma, II Year

2103920500072

SUBMITTED TO

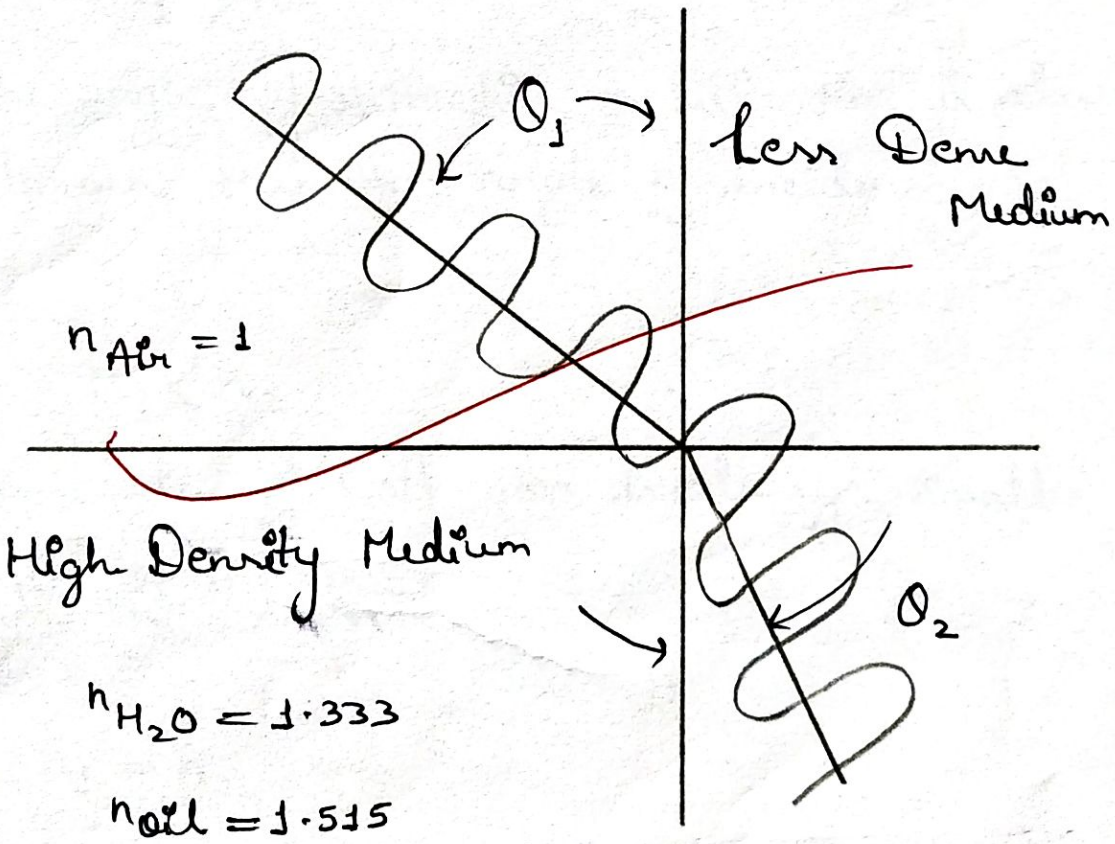
Ms. Kalpana Verma

INDEX

Physicochemical Properties Of Drug Molecules :-

Refractive Index :-

Refractive Index (Index of Refraction) is a value calculated from the ratio of the speed of light in a vaccum to that in a second medium of greater density. The refractive index variable is most commonly symbolized by the letter n or n' in descriptive text & mathematical equations.



Refraction of Light

s presented in the figure above, a wavefront ncident upon a plane surface separating two media s refracted upon entering the second medium if the ncident wave is oblique to the surface. The incident ngle (θ_1) is related to the refraction angle (θ_2) y the simple relationship known as "Snell's law".

$$n_1 \times \sin(\theta_1) = n_2 \times \sin(\theta_2)$$

here,

n = Refractive index of material (1) & (2)

θ = Angles of light travelling through there materials with respect to the normal.

f,

$$n_1 > n_2$$

then, the angle of refractive or refraction is always larger than the angle of incidence.

f,

$$n_1 < n_2$$

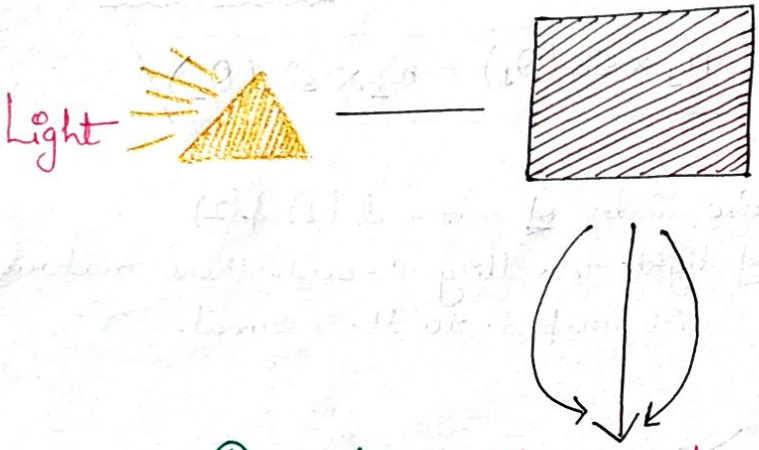
en, the angle of refraction is always smaller than the angle of incidence.

f,

$$n_1 = n_2$$

en, the light is passed through without any type of refraction.

OPTICAL ROTATION



Optical Rotation :—

→ The optical Rotation is the angle through which the plane of polarization is rotated when polarised light passes through a layer of liquid.

→ Optical activity is the ability of a compound to rotate the plane of polarized light.

→ The property of rotating rises from an interaction the electromagnetic radiation of polarized light with the unsymmetric electric fields generated by the electrons in a chiral molecule.

→ A compound is said to be optically active when the linearly polarised light is being rotated when it is paring through it.

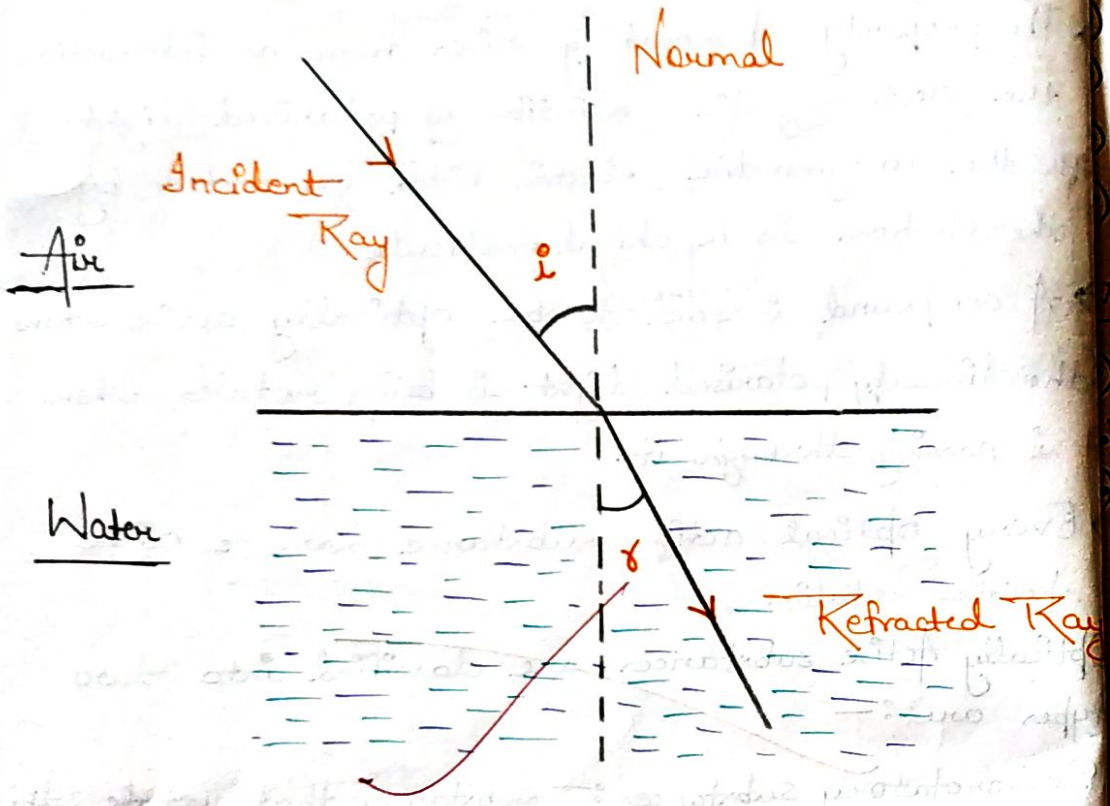
→ Every optical active substance has its own specific rotation.

Optically Active substances are classified into two types are :—

1) Dextrorotatory substances :— Substances that rotate the plane of polarization of the light towards the right are known as right handed or Dextrorotatory.

2) Laevorotatory substances :— Substances which rotate the plane of polarisation of the light toward the left are known as Left handed.

Snell's Law :-



5) Dielectric Constant :-

It is the ratio of permitivity of medium (ε) upon permitivity of free space (ε_0).

$$\text{Dielectric Constant} = \frac{\varepsilon}{\varepsilon_0}$$

Measurement :-

1) Co-axial problem method.
2) free space method.
3) Resonant cavity Method.
4) Parallel-plate Capacitor method.

Applications :-

1) Dielectrics are used to manfacture capacitor.
2) Used to manufacture transformer.
3) They are used in measuring & heating process.

Snell's Law :-

It gives the relation between the angle of incidence & angle of refraction.

$$\eta = \frac{\sin i}{\sin r}$$

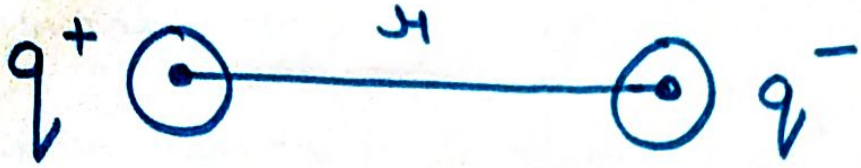
where,

i = Angle of incidence

r = Angle of refraction.

DIPOLE MOMENT :—

→ The mathematical product of the charge into distance.



$$\mu = q \cdot r$$

where,

μ = dipole moment

q = charger product

r = distance present between the two charger.

→ The measurement of net molecular polarity, which is the magnitude of the charge Q at either end of the molecular dipole times the distance r between the two charger.

→ The SI unit for electric dipole moment is the Coulomb–meter (C·m)

Is Dipole moment a force?

→ Whenever two equal & opposite charger are brought together there will be either some attraction or repulsion force between them.

DISSOCIATION CONSTANT:—

- The dissociation constant is an immediate consequence of the law of mass action which describes equilibria in a more general way.
- The dissociation constant is also sometimes called Ionisation Constant when applied to salts.
- The inverse of the dissociation constant is called "Association constant".
- The dissociation constant is usually written as a quotient of the equilibrium concentration (in mol/L).

$$H_2O \rightleftharpoons H^+ + OH^-$$

According to law of mass Action.

$$\text{Rate of Reaction} \propto \frac{[H^+][OH^-]}{[H_2O]}$$

$$\frac{dx}{dt} = \frac{K_a [H^+][OH^-]}{[H_2O]}$$

$$\boxed{K_a = \frac{[H_2O]}{[H^+][OH^-]} \cdot \frac{dx}{dt}}$$