SAMSKRUTI COLLEGE OF PHARMACY

Kondapur Village, Ghatkesar Mandal, R.R. Dist.

ANSWER BOOK FOR TERM EXAMINATIONS

✓ Mid Exam / Lab Examination for 2nd Year 1st Semester R17

Regulation of B. pharmacy Course pharmacy Branch

Name of the Student	H.T. No.	Subject Name
V. Bhavya	2 0 Y 7 1 R 0 0 9 9	Physical pharmaceutics-I

Instructions to the students

- Fill all the details neatly and legibly.
- Processing of prohibited material or misbehaving with the invigilator / co-students will lead to booking a malpractice case.
- Answers must be written neatly on both sides of the paper.
- Get your own Graph Sheets / Data Books / Date Tablets etc.
- It is the responsibility of the student to handover the answer script to the invigilator.

For Examiner use only — Marks Awarded — MID - I

Q.No.	1	2	3	4	5	Obj	Asst
a	4		1				05
b			1½				
c							
Total	4		2½			7	05

GRAND TOTAL — In Figures: 19 — In Words: One Nine — Signature: Manuscha

For Examiner use only — Marks Awarded — MID - II

Q.No.	1	2	3	4	5	Obj	Asst
a	3½			4			
b							
c							
Total	3½			4		10	5

GRAND TOTAL — In Figures: 23 — In Words: Twenty three — Signature: Manuscha

For Examiner use only — Marks Awarded

Name of the Examination	Maximum Marks	Marks Awarded
MID - I	25	19
MID - II	25	23
Total	50	42

Average Marks obtained for MID Examination: 21 — Signature: Manuscha

Lab Internal Examination — For Examiner use only Marks Awarded

Q.No.	Max. Marks	Marks Awarded
Synopsis	5	4
Major	10	9½
Minor	5	5
Viva - Voce	2	1
Day to Day Assessment	3	2

GRAND TOTAL — In Figures: 22 — In Words: Twenty two — Signature: Manuscha

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Manuscha

Signature of the Examiner

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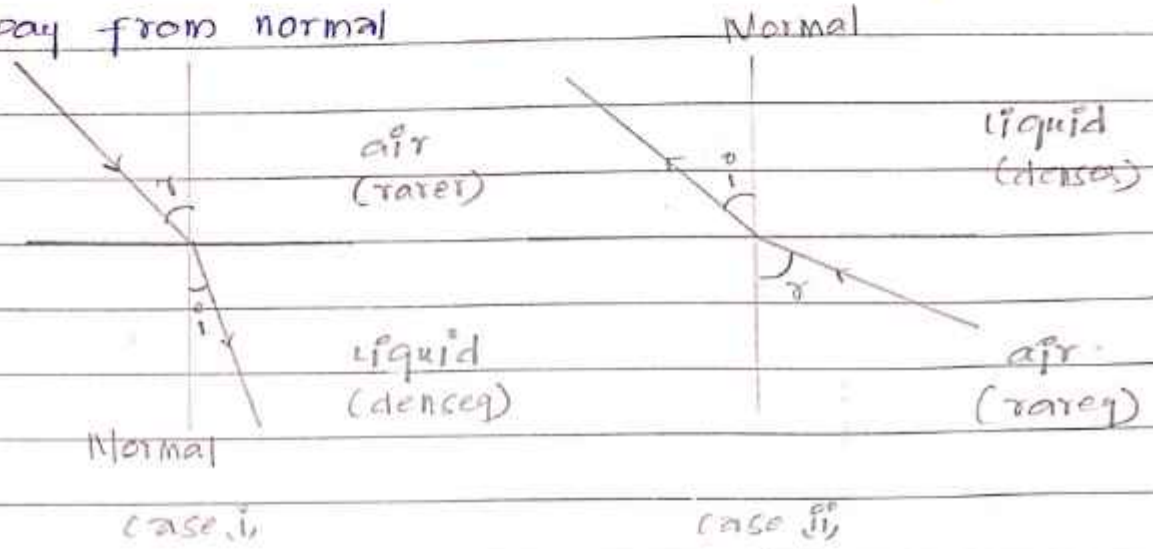
Samskruti College of Pharmacy
Kondapur(V), Ghatkesar(M),
Medchal Dist. PIN-501301

MID-1 EXAMINATION

1. Refractive medium :

When a light is passing from one medium to another medium i.e refraction. So, when a light pases from rarer (air) medium to denser medium (water) light refracts towards the normal.

In case ii, when a light is passes from denser medium (water) to rarer medium (air) light reflects away from normal



Snell's law states that refraction of light on the sine of angle of incidence to sine of angle of refracti

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

refractive index is a characteristic of a liquid. when a light is passes from rarer medium to denser medium the velocity of light increases from denser to rarer

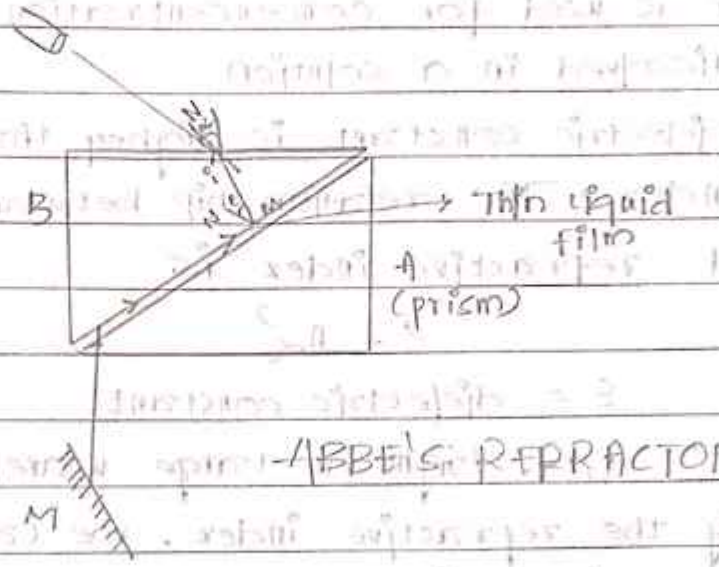
$$= \frac{\text{velocity of light in vaccum}}{\text{velocity of light in liquid}}.$$

The concept of refractive index is that when a ray of light is incident on liquid the light photons interacts with the molecule and imbalance the electron cloud. So, some what of supplied energy is spent, because of supplied energy the velocity of light

decreases when it enteys into denseq medium.

Deteqminations:

The instrument used in refractive indeq is abbe's refractometeq. Sereqal otheq refractometeqs are available but it is veqy quick and convinient to use.



ABBE'S REFRACTOMETER.

construction of refractometeq is a glass and a wateq jacket is present on the refractometeq. Magnifiel glass and used for glass in abbe's refractometeq

Method: The prism aqe taken A and B. when a light is passes from the sodium lamp it incident on the mirror M. The incident light is travel through the prism system. A drop of wateq pour on the prism A it should be finely distributed like a liquid film.

The incident which is incident on prism A system touch the prism A and travel through liquid film and incident on prism B.

The light which qoses prism B travel at 90° of the angle (called the critical angle). The incident will pass through the prism B. The light which is passed from prism B are calculated by the telescope (angle α).

The abbe's refractometeq is quick and convinent which is direcqy measures the molar fraction.

The prism age immovable whege as telescope age movable. Therefore we obtain the correct critical angle of refractive index of abbe's refractometer.

Applications :-

i) It is used to identify a substance.

ii) It is used for concencentration of liquid dissolved in a solution

iii) Dielectric constant is highey than the refractive index. The relationship between dielectric constant and refractive index is

$$\varepsilon = n_\alpha^2$$

ε = dielectric constant

n_α = light at large wavelength

iv) By the refractive index, we can easily know molar refraction without any expeqiment

v) molar polarisability of refractive index is consideyed.

$$\frac{n_\alpha - 1}{n_\alpha - 2} \frac{M}{C} = \frac{1}{S},$$

vi) defining a substance which is present in the solution.

3A Inorganic metal ion complexes :-

The inorganic metal ion complex age electron donor and charge transfey.

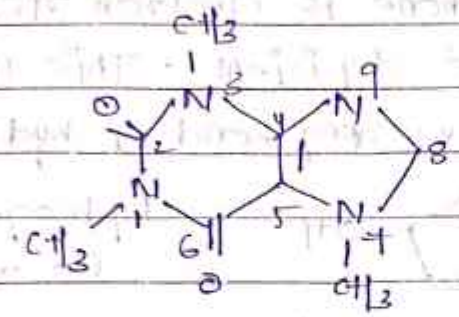
Molecule, compound
1. Drug - caffeine compler
2. polymey complex
3. picric acid complex
4. Quinhydrone complexes.

1. Drug caffeine compler :- when the drug is immiscible in caffeine compler

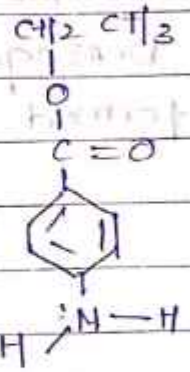
The formation of drug caffeine complexes are barbiturates, sulphonamides etc.

The drugs like procaine, tetraine are react with caffeine to form complexes. The caffein complexes

Caffeine



Benzocaine



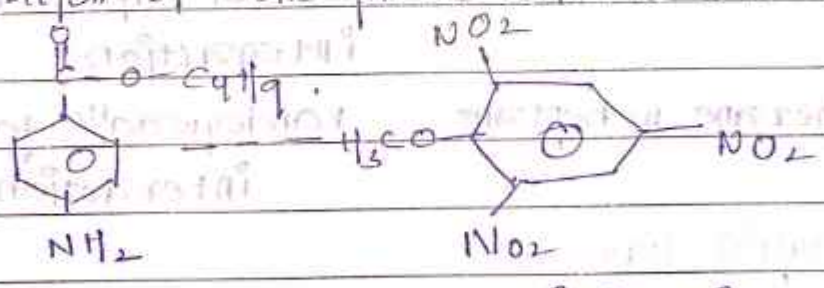
The nitrogen at position (1) is higly negative strongeg. it receives negative charge from oxygens (6 and 2) position. so it is forms more complexation. The drug caffeine has mask of Bitteg taste. They are used in preparation of tablet The drug caffeine involves the benzocaine and caffeine molecule

2. polymeg complex.

The polymeg complex incompatibility of drugs. It is used in preparation of suspensions emulsions etc. The polymeg complex involves formation of polymeg complex of the complex.

3. picric acid :-

1'). Butiene is used in ointment & creams etc. The 1:2 ration of the picric acid is shown below.



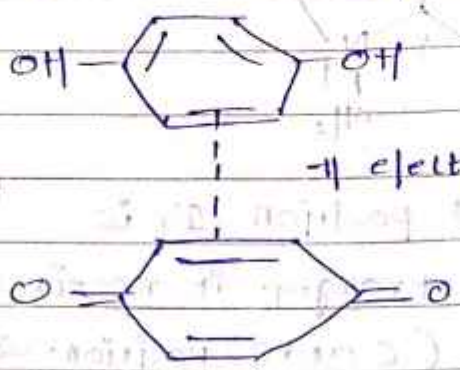
picric acid.

picric acid complex is reacts to form the picric acid and Butiene:

Quinhydrone complex :-

The mixture of alcoholic solutions of 1:1 ratio of benzoquinone and hydroquinone will form quinhydrone complex.

The hydroquinone is electron rich where as benzoquinone is e deficient. This line which is formed is the weakey bond of hydrogen ions



Mechanism

π e framework of the hydroquine & benzoquinone

B) ideal solutions :- ideal solutions are the solution in which there is no change in the component when these are mixed together. It obeys the roult's law.

During mixing energy is nor provided (or) absorbtion. During mixing shrinkage (or) absorption is also not occur.

Methane - watey	hydrogen bonding
Benzene - toulene	induced dipole induced dipole interaction
n-hexane, n-heptane	randeywaal's forces, dipole interaction.

Roult's law :-

roult's law states that total vapour pressure of a liquid in volatile constituent is equal to vapour pressure of a pure liquid is multiplied

by mole fraction, at a given temperature.

When two miscible liquids A and B are mixed each other

The total vapour exerted on liq A $= K_A P_{Ka}$

Total vapour pressure exerted on liq B $= K_B P_{Ka}$

vapour pressure on pure liq A $= K_A^\circ P_{Ka}$

vapour pressure exerted on pure liq B $= K_B^\circ P_{Ka}$

mole fraction of exerted on liq A $= X_A P_{KA}$

mole fraction exerted on liq B $= X_B P_{Ka}$

The total vapour pressure on the liquids	=	vapour pressure of pure liquid	×	mole fraction on the liquid.

$$K_A = K_A^\circ \times X_A$$

$$K_B = K_B^\circ X_B$$

1/2

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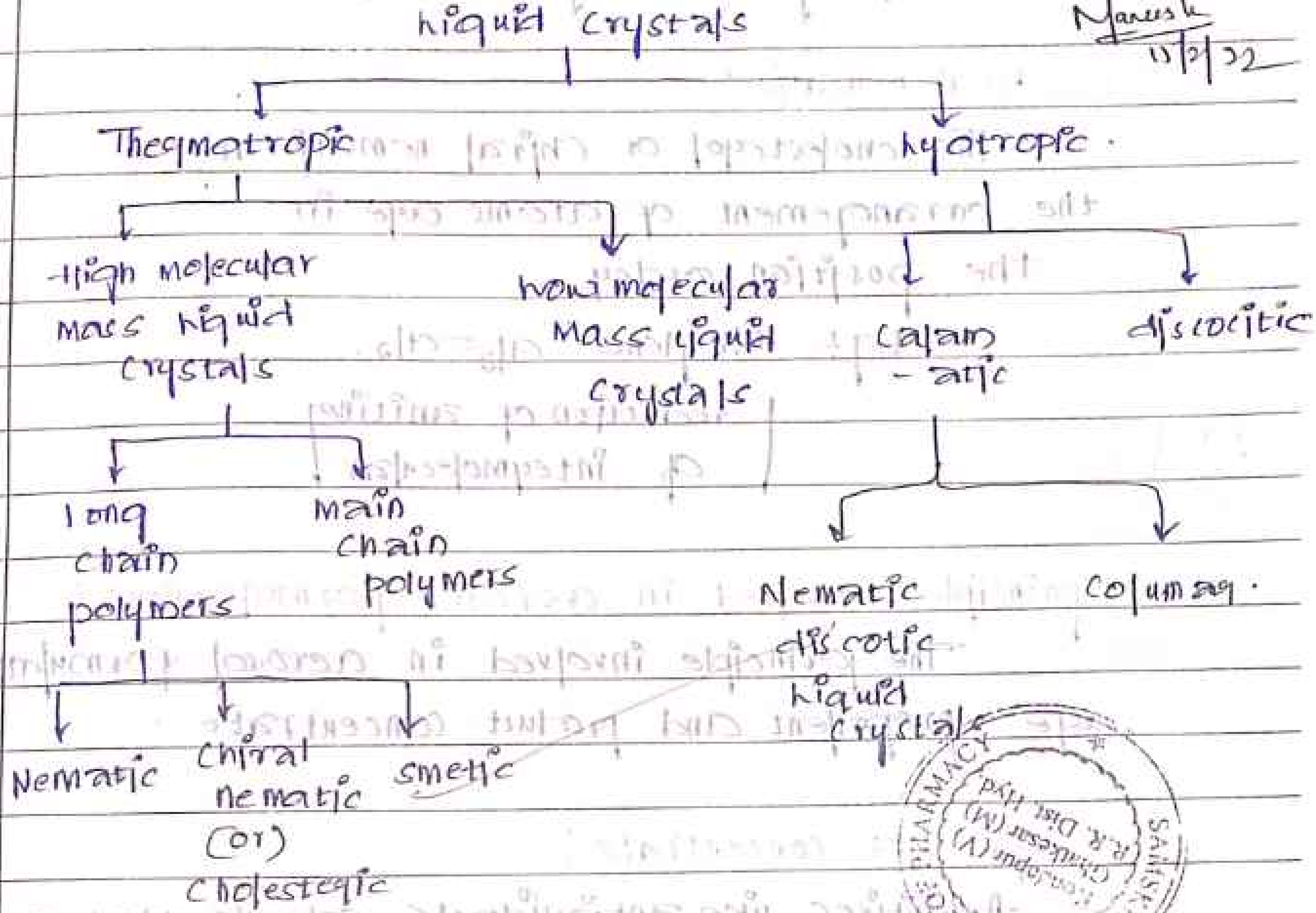
MID-II EXAMINATION

15/02/2022

Manesh 11/2/22

8. Liquid crystals



1. Thermotropic liquid crystals:- Thermotropic liquid crystals are the when increase in the temperature they increase in the internal energy to form a liquid crystals.

Monotropic liquid —inter convected→ Ecot ropic liquid due to menophace.

The are divided in to two groups:-

1. High molecular mass liquid crystals:-

The high molecular mass liquid crystals are the liquid crystals which have high mass when compared to low molecular mass liquid crystals. The high molecular mass liquid crystals are divided in to long chain polymers and main chain polymers.

1. Nematic:-

They have no positional order

They have structural arrangement of partic

The line is pass along the axis

2. Chiral nematic :-

The cholesteryl or chiral nematic are the arrangement of atoms are in the position order

eg :- Alkylene $CH_2=CH_2$.

reduction of aniline of intermolecular

principle involved in aerosol formulations :-

The principle involved in aerosol formulations are propellent and product concentrate.

1. product concentrate :-

Additives like antioxidants, solvents that are used for the product concentrate in which they are formation of aerosol will be present.

2. propellent :-

The propellent and product concentrate are packed in same aerosol container they maintain equilibrium at which they are when coming to external environment to the actuator they are vapourised in the external environment.

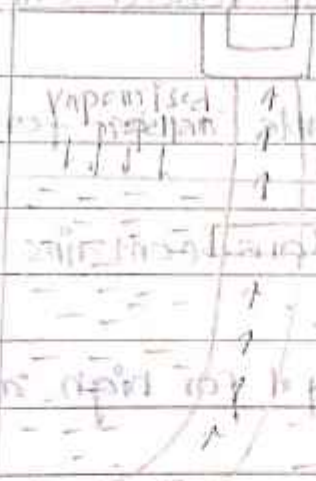
The propellent and product concentrate the liquified gases acts as propellent at which it serves as a suitable and reach the top of aerosol container.

That's why they aerosols are called pressurized dosage forms (or) biphasic pressurized liquid dosage forms.

The product concentrate and propellent out with phase one is vaporised propellent, and phase ② is medicament, liquid propellant and propellent concentrate.

so, the aerosol formulation which ac mainly used in sprays, etc. These are easily attack the wounds/ heals which gives proper medication. The propellent and product concentrate placed in same aerosol containers liquid, occure as crystals when they reach the external environment.

so, the aerosol formulation is occured through the propellent and product concentration.



The product concentrate and propellent are they are principle involved in aerosol containers.

4 Aerosol containers :-

Aerosol containers are consists of two parts

- container body
- valve assembly.

Container body :-

container body of the aerosols are made up of different materials.

1. plastic
2. Tin steel container
3. Aluminium container
4. Glass container.
5. stainless steel container.

* Glass containers :-
  - Glass containers are highly preffered.
  - they resistance for formulations
  - they dont subjected to corrosion
  - outer part of glass containers made with plastic they resistant to damage.
  - inner part are also coated and they resistant to formulation.
  - they are compatable c the formulations.

* Aluminium :- they are contains which are used now a-days.

These containers useful for high amount of the sample.

- They are made up of aluminium.

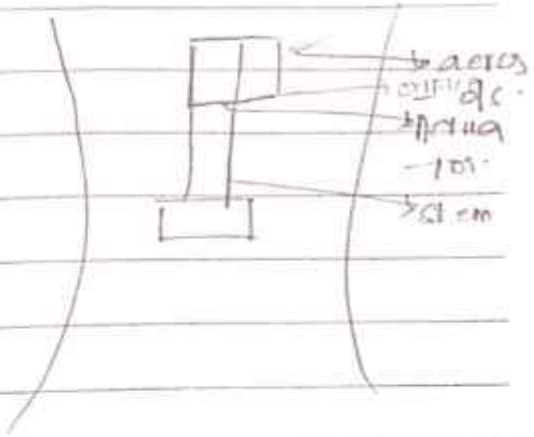
disadvantage
- leakage
- corrosion

Compatible c formulation

- stainless steel container :-
  - high cost
  - large vessels

* plastic containers :-
- made up of plastic which are rarely used.

Valve assembly :-



1. Actuator
2. Stem
3. diptube
4. glass
5. valve
5. orifice.

Actuator :- opening and closing of the aerosol container. At which the propellent and product concentrate reach the top surface of aerosol container.

Stem :- The stem at which the aerosol container the aerosol mixture passes through the stem to the actuator of the aerosol system

Diptube :- diptube is which the aerosol container system of the aerosol container of the body.

The aerosols which are passing from vapourised propellent they are the most useful for formation of aerosols of the container.

- Orifice :- The passing of propellent & product concentrate through orifice by the opening and closing of actuator.

The diptube used and it starts from the bottom of the aerosol container.

The parts of the housing is the link between dip tube, stem and actuator.

- This aerosols of valve assembly of the aerosole system at which the glass containers are used

Principal

LAB INTERNAL.

1. write shorte note on latent heat of vapourisation
2. Explain indetail solubility expression.

II Major experiment.

1. determine the flow property of powder using angle of repose & report it.

III Minor experiment.

Determine the unknown conc^{n} of NaCl using phenol water system by CST method & report it.

1. Methods of expressing concentration:

1. weight percent:

weight percent of a solute is found by expression as:

$$\text{weight \% of A} = \frac{\text{weight of A}}{\text{total weight of solution}} \times 100$$

volume percent:

$$\text{volume \% of A} = \frac{\text{weight of A}}{\text{total wght of system}} \times 100$$

equivalent wght:

It is weight of an element is mass when combines with or displaces 1 gm of hydrogen.

$$\text{Equivalent wght} = \frac{\text{Atomic weight in gms}}{\text{Valance (no. of replacable H or Pons)}}$$

Normality:

$$= \frac{\text{weight of solute taken in gm}}{\text{1 equivalent weight in gm}} \times \frac{\text{volume of solvent in ml}}{1000}$$

Molarity:

$$= \frac{\text{weight of solute taken in gm}}{\text{1 molecular wght in gm}} \times \frac{\text{volume of solvent in ml}}{1000}$$

Molality:

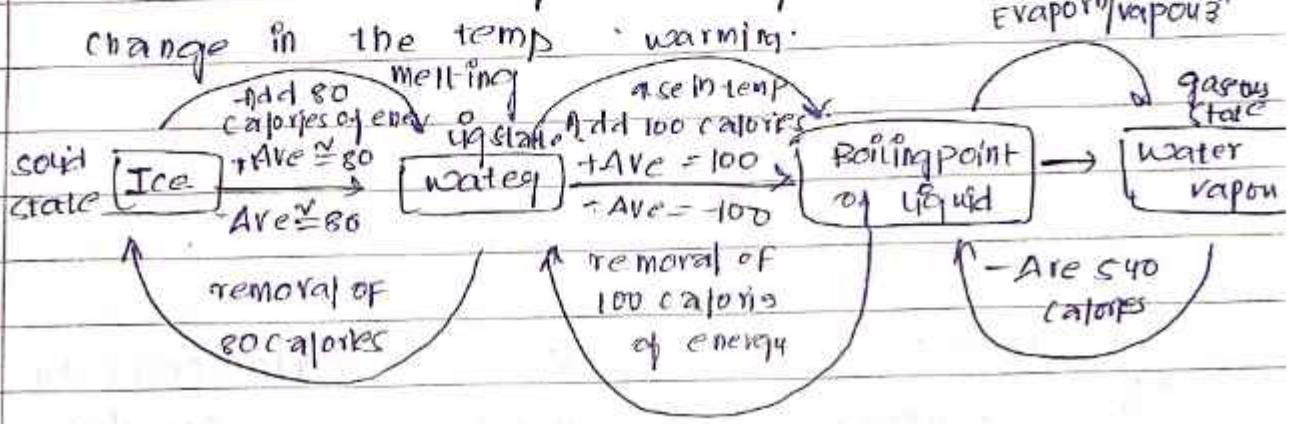
$$= \frac{\text{weight of solute takes in gm}}{\text{1 mole. weight in gm}} \times \frac{\text{weight of solvent in gm}}{1000}$$

% solution :-

1. w/w : (weight of solute/ wgt of soln) x 100.
2. w/v : (wgt of solute/ volume of soln) x 100.
3. v/v : (volume of solute/ volume of soln) x 100.

1. latent heat of vapourisation :-

The change in the state of matter resulting in the change in physical state of molecule associated with the heat change absorbed/ liberated without change in the temp. warming.



freezing	cooling	condensation
• no change in temp • change in latent heat ± 80 calories latent heat of fusion	• change in temp • no latent heat released/ absorbed	• No change in temp • latent heat ±540 calories Latent heat of vaporisation.

II Major experiment :-

Aim :- To evaluate the flow properties of the lactose powders by angle of repose.

procedure :-

- A glass funnel is held in place with a clamp on a ring support over a glass plate. glass plate is placed on a micrometer jack.

- Approximately 50g of lactose powder is transfer into the funnel. Keeping the orffice of funel blocked
- As the thumb is removed, lab jack is adjusted so as to lower plq

Observation :-

S.No	Name of powder	Hgnt of heap (h) cm	radius heap, r (cm)	Angle of repose tan θ = h/r	flow pro
1		2.7	12.9	10.75	
2	Lactose	2.9	14.2	11.30	
3		3.3	13.4	12.49	Excell.
		Average		11.54	

Repose Lactose 11.84 flowpropesity Excellent

III minor experiment :-

Aim :-

To detegmine the concentration of the given solution of sodium chloride using phenol-water syster by CST method

Quantity of NaCl	Quantity of water in ml	% composition of NaCl	Temp at which turbidity (t_1)	Temp at which [illegible] (t_2)	CST in $\frac{t_1+t_2}{2}$
1	9	0.1	57	51	54
2	8	0.2	58	56	57
4	6	0.4	63	60	61.5
6	4	0.6	65	62	63.5
8	2	0.8	67	65	66
10	0	1.0	70	68	69
unknown	To 10	unknown	64	61	62.5

Report:

- Miscibility temperature (CST) of unknown sample is 62.5°C
- percent composition of unknown sample of NaCl solution = 0.5%.

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B Pharmacy

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ANSWER BOOK FOR TERM EXAMINATIONS

Mid Exam / Lab Examination for mid-I Year II Semester

Regulation of R17 Course B.Pharm Branch

Name of the Student	H.T. No.	Subject Name
V. Shiva kumar	2 0 Y 7 1 R 0 0 9 8	physical pharmaceutics

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For Examiner use only Marks Awarded — MID - I

Q.No.	1	2	3	4	5	Obj	Asst
a	3½		1				05
b			1				
c							
Total	3½		2			5	05

GRAND TOTAL		Signature
In Figures	In Words	
16	One Six	Maneesha

For Examiner use only Marks Awarded — MID - II

Q.No.	1	2	3	4	5	Obj	Asst
a		4½	4				
b							
c							
Total		4½	4			5	5

GRAND TOTAL		Signature
In Figures	In Words	
22	Twenty two	Maneesha

For Examiner use only Marks Awarded

Name of the Examination	Maximum Marks	Marks Awarded
MID - I	25	16
MID - II	25	22
Total	50	38

Average Marks obtained for MID Examination	Signature
19	Maneesha

Lab Internal Examination
For Examiner use only Marks Awarded

Q.No.	Max. Marks	Marks Awarded
Synopsis	5	3½
Major	10	9½
Minor	5	4½
Viva - Voce	2	1
Day to Day Assessment	3	2

GRAND TOTAL		Signature
In Figures	In Words	
22	Twenty two	Maneesha

Maneesha

Signature of the Examiner

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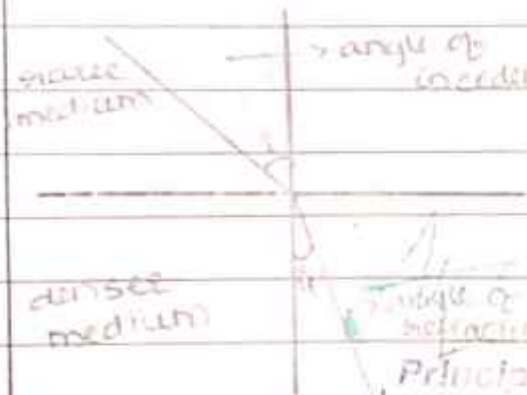
mid-1

10/8 Refractive index: The refractive index is defined as the Ray which passes from one medium to another medium therefore the direction of rays which passes towards (or) away from the Normal.
This phenomenon is known as refractive index.

* The angle of incidence which passes from rarer medium to denser medium i.e it goes towards the normal.
* The angle of refraction which passes from denser medium to rarer medium i.e it goes away from the normal.



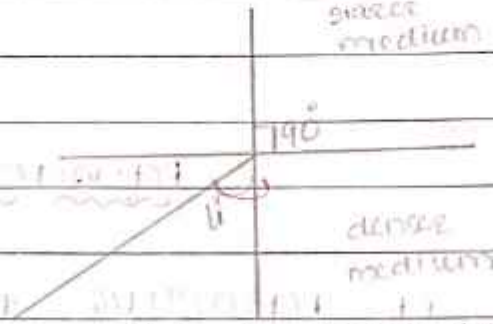
Determination of Snell's law:

The angle of incidence which passes from less denser i.e rarer medium to denser
∴ $i < r$
The angle of refraction which passes from denser medium to rarer $i > r$.

$$n = \frac{\sin i}{\sin r} \Rightarrow \boxed{n = 1/\sin r}$$

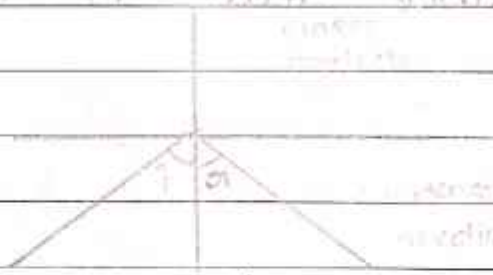
critical angle:- The angle of incidence of the rarer medium and the angle of refraction in the denser medium are at 90° this phenomenon is called critical angle.

$$n = 1/\sin r.$$



critical angle 90°

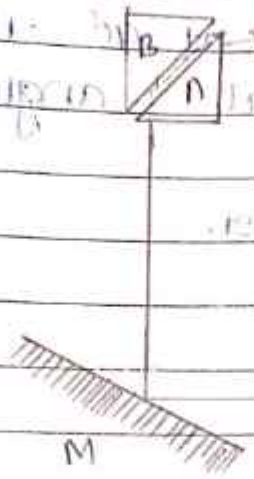
Total internal reflection:-
If the angle angle of incidence is greater than the critical angle 90, this is called as total internal reflection.



Total internal reflection.

Determination of Abbi's refractometer.
* The drop of a water is placed on the phase A/prism A.
* when we refracts both prisms phase A & B. the water should be spread and the light ray refracts the ground.
* The angle of refraction goes upwards.

The M mirror bends the light ray and that refracts to the ground.



Refractometer.

Applications of refractive index.

① Determine the identification of a substance.
② Determine the purity of the substance.
③ Determine the concentration of substance that is dissolved.

(3b) RAOULT'S LAW: It is defind as the partial pressure of each volatile compound of a solution at any temparature is equal to the vapour pressure of mole fraction and its pure solvent this phenomenon is known as raoult's law.

$P_A = P_0 X_A$

$V_i P \cdot P_{ave} = V \cdot PP$.

$$X_A = \frac{n_A}{n_A X n_B}.$$

n_A => mole fraction of compound A

n_B => mole fraction of compound B.

$$X_B = \frac{n_B}{n_A X n_B}.$$

Ideal Solutions:-

Ideal solutions that there is no change in the comparing property that is in this shrinkage takes place.

Examples of ideal solutions:-

(i) methanol + water :— Hydrogen bonding and dipole interactions.

(ii) Toluene + water :— Non polar and dipole induce interactions.

(iii) Benzene + *.

(3A) Inorganic metal ion complexes.

Metal complexes:-

(i) Inorganic metal

(ii) chelate.

(iii) Pyrin.

(3B)

Metal ion:- In this, metal ion is the central atom of the complexes metal ion are used. and the ligand is.

Chelate:- chelates are the complexes that.

Mid-II Exam

Manasa 15/2/22

Date: 15/02/22.

(20) Gas laws: According to their functions and these are determined by four types:-

① Boyle's law
② charles law
③ Avagadro's law
④ Ideas gas

① Boyle's law: This law was invented by the scientist Boyle after this got as a name Boyle's law.

* He invented in the year 1660

Def: According to this law states that The volume of a gas is inversly proportional to the pressure, when the absolute temparature is constant.

$$V \propto 1/p \quad (T \text{ and } n \text{ are constant}).$$

$$V = K \times 1/p$$

$$pV = K$$

∵ K is proportionality constant.

* According to this law we can write like

$$P_1V_1 = P_2V_2.$$

P_1 = Intial pressure of a gas
P_2 = Final pressure of a gas
V_1 = Intial volume of a gas
V_2 = Final volume of a gas.

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② Charle's law:-

* This law was invented by the scientist charle in the year 1970.

Def:- According to this law states that when the pressure of a gas is constant the volume of gas is directly proportional to the temparature.

$V \propto T$ (P and n are constant)

$V = T$

$V = KT$

$\frac{V}{T} = K$. (K = proportionality constant).

This formula write like:

$\frac{V_1}{T_1} = \frac{V_2}{T_2}$.

V_1 = Intial volume of gas, V_2 = Final volume of a gas

T_1 = Intial Temparature of gas, T_2 = Final temparature of a gas.

③ Avagadro's law:-

This law includes that pressure and Temparature of a gas is constant, the volume of gas is inversly proportional to the number of moles.

$V \propto 1/n$. (P and T are consi)

$V = \theta n$.

$\frac{V}{n} = \theta$.

θ is proportionality constant.

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④ Ideal gas:- This ideal gas is a combine of Boyle's law, charles law and Avagadro's law.

* Formulae of Boyle's law ⇒ $PV = K$.
* Formulae of charles law ⇒ $\frac{V}{T} = K$.
* Formulae of Avagadro law ⇒ $\frac{V}{n} = A$

- Boyle's law + charles law + Avagadro law
$= PV + V/T + V/n = R$.
$= PV = V/1 + V/n$
$PV = V/Tn$.
$PV = nRT$

⑤ The aerosal contains two types.
1) container body
2) valve assembly.

① container body:- The container body is made up of different particles they are different types.
① Glass, uncoated or coated steel
② Tin plated steel
③ Aluminium
④ stainless steel
⑤ plastics.

① Glass.
→ This glass is protected from the corossion
→ It used to prepare for attracting by people.
② Tin plated steel.
→ It is protected against corossion.

③ Aluminium:-
→ It is mainly used now-a-days
→ more importance for this due to work flastly and safe.

④ Stainless steel:-
→ It used less because it contains huge cost.

⑤ plastic:
→ It doesnot use mare.
→ less chances for plastic containers.

Valve assembly:-
→ This is mainly contains of eight types of parts.

① Actuator	⑤ spring
② stem	⑥ mountaide cup
③ gasket	⑦ housing.
④ orifice	⑧ diptube.

① Actuator:-
* It activates the valve assembly by giving pressure
* It helps to open and closing like button.

② stem:-
* It gives support to the Actuator.
* It delivers the liquid.

③ gasket:-
* It helps from the leakage of gas.

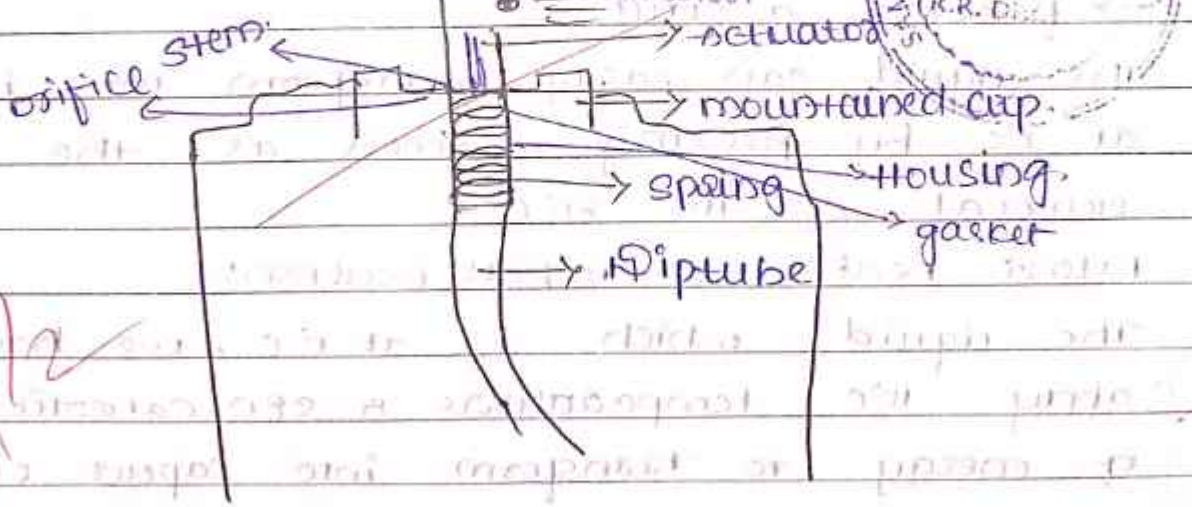
④ orifice:-
It helps to open and close from the valve assembly or actuator valve assembly.

⑤ Spring:-
* It give the support to the stem and helps to deliver the liquid when pressure gives.

⑥ mounted cup:-
* It is below the spring.

⑦ Housing:-
* It is the link between the Actuator, stem and diptube.

⑧ Diptube.
* It is long pastic tube that helps in the sending of liquid from the container body to out
* It extends upto the bottom of the container body.



lab internal.

① write a short note on latent heat of fusion and vaporization?

② explain in detail the solubility expression.

II major Experiment:

Determine the flow property of the given powder using angle of repose method and repeat it.

III Minor experiment:

Determine the corrosion concentration of sodium chlorate using phenol water system by CST method and repeat it.

IV Record

V Vivavose.

① latent heat of fusion:-

solid - liquid - transition without change in temparature.

→ melting a solid

→ freezing a solid

The liquid can easily transform into ice at 0°C by freezing process as the removal of the 80°C.

latent heat of vaporisation:-

The liquid which is at 0°C, we have to apply 10°C temparature & 580 calories of energy to transform into vapour on condensing and on removal of 580 calories it can easily transformed into liquid at 10°C

② Solubility expressions:-

→ Solubility of a substance can be defined as no. of particle required for one part of solute

→ solubility can be expressed as molarity, Molality % weight.

→ European pharmacopia has 6 groups and us pharmacopia has 7 groups.

form of drug	No. of particles required for one part of solute.
Very soluble	<1
more soluble	1–10
soluble	10–30
Sparingly soluble	30–100
Slightly soluble	100–1000
Very slightly soluble	1000–10000
completely soluble	>10,000.

Major experiment

Aim:- To evaluate the flow properties of the given powder by Angle of repose.

Calculation:- Sample – lactose

Trial	Name of Powder	Height of heap (h)	Radius of heap (r)	Angle of repose $\tan^{-1}(h/r)$	Flow property
1.		2.7	13.9	10.75	
2.	lactose	2.9	14.2	11.30	Excellent
3.		3.3	13.4	13.49	

Avg = 11.84

Report:-
Angle of repose of lactose is 11.84, and flow property is excellent.

9/2

Minor Experiment

Aim:- To determine the Concn of the given solution of sodium chloride using phenol-water system.

Observation:-

Quantity of Nacl in ml	Quantity of water in ml	% Composition of Nacl	CST
1	9	0.1	54
2	8	0.2	57
4	6	0.4	61.5
6	4	0.6	63.5
8	2	0.8	66
10	0	1.0	69
unknown	10	unknown	62.5

Report:-
→ The miscibility temperature (CST) of unknown sample is 62.5°c
→ Percent Composition of unknown sample of sodium chloride solution = 0.5%

4/2

Principal
[illegible] College of Pharmacy
[illegible]pur(V), Ghatkesar
Dist. [illegible]

SAMSKRUTI COLLEGE OF [illegible]
Kondapur
Ghatkesar
R.R. Dist.