ODD SEMESTER

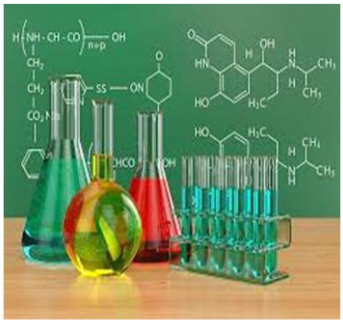
Tirumala Tirupati Devasthanams

S.G.S ARTS COLLEGE

(శ్రీ గోవిందరాజ స్వామి తర్జ్ కళాశాల)

(AFFILIATED TO SRI VENKATESWARA UNIVERSITY, TIRUPATI)

ISO CERTIFIED INSTITUTION



DEPARTMENT OF CHEMISTRY

REMEDIAL CLASSES

2022 - 2023

III rd SEMESTER

&

V th SEMESTER

PHONE :(0877)2264599 Email: sgsartscollegettd@gmail.com Web:sgsac.edu.in

S.G.S ARTS DEGREE COLLEGE, T.T.D

Tiruchanur road, TIRUPATI-517501

Remedial classes – ODD SEMESTERS

CIRCULAR

DATE: 01-12-2022

All the H.O.D'S of the department here by instructed to plan remedial classes for slow learners of III & V semesters in order to improve their learning capability and for further improvement in the forthcoming university examinations. The TIME-TABLE for the conduct of remedial classes for slow learners is enclosed. The classes maybe conducted out of the college hours i.e. before 10:00AM/after 04:00PM

PRINCIPAL 01/12/2022

PRINCIPAL
S.G.S. ARTS COLLEGE
T.T.D., TIRUPATI.

OM NAMOVENKATESAYA
TIRUMALA TIRUPATI DEVASTHANAMS:: TIRUPATI
S.G.S.ARTS DEGREE COLLEGE
DEPARTMENT OF CHEMISTRY

Sri. D. PARAMESWARA
M.Sc, M.Phil (Ph.D)
HOD OF CHEMISTRY

PHONE NO: 9490728655
Mail.ID:parameswara1964@gmail.com

NOTICE

Date: 05-12-2022

SGSAC/Chem dept/Remedial classes-2022/HOD/01

All the slow learners in chemistry of III &V Semesters as enclosed in the list are here by intimated that remedial classes are planned to conduct from 07-12-2022 in room numbers 225 & 230 from 04:00 to 06:00 pm. They are further instructed that attendance is mandatory. Stringent action will be taken against the students who will be absent for the remedial classes.

ACADEMIC YEAR 2022 - 2023

II B.Sc III Semester

S.NO	HALL Ticket Number	STUDENT NAME	GROUP & Medium
1	322008005	B.Aravind	BBC (E.M)
2	322008007	M.Devendra naik	
3	322008015	L.Jayaprakash	
4	322008016	M.Balaguraiah	
5	322008021	M.Jeevan	
6	322008025	M.Mukesh rushi.	
7	322008029	P.Poojitha	
8	322008030	S.Sudheer	
9	322008035	Y.Suresh	
10	322008043	G.Jyoshna	CBZ (E.M)
11	322008044	G.Karthik	
12	322008045	G.Manohar babu	
13	322008049	K.Raju	
14	322008050	K.Sangeetha	
15	322008051	K.Anjali	
16	322008062	Shaik Ahmed Ali	
17	322008065	T.Teja	

18	322008138	Alangadu Rohith	MPC (E.M)
19	322008139	A.Mallikarjuna	
20	322008142	A.Sanjay	
21	322008143	B.Vishnuvardan naidu	
22	322008148	Chintha Naveen	
23	322008150	D.Dathu	
24	322008159	K.Niranjan	
25	322008166	M.Srinath	
26	322008167	M.Naveen Anil	
27	322008170	P.Pavan kumar	
28	322008171	P.Sunil babu	
29	322008172	P.Mallikarjuna	
30	322008179	Thumma Deva	
31	322008182	Y.Harikrishna	
32	322008268	C.Siva	MZC (E.M)
33	322008270	E.Bhargavi	
34	322008271	Gali Jahnavi	
35	322008272	Golla Madhu	
36	322008283	M.Gajendra naik	
37	322008285	M.Baby Priyanka	
38	322008286	N.Renuka	
39	322008291	P.Ramya	
40	322008292	P.Mahesh	

III B.Sc V Semester

S.NO	HALL Ticket Number	STUDENT NAME	GROUP & Medium
1	321008021	M.Kalyan	BBC (E.M)
2	321008023	M.Dheeraj	
3	321008024	M.Varaprasad	
4	321008027	O.Pavankumar raju	
5	321008029	P.Chand basha	
6	321008035	S.Surendrababu	
7	321008037	S.Praveen	
8	321008053	D.Narasimhavardan	CBZ (E.M)
9	321008058	J.Radhika	
10	321008065	L.Praveen	
11	321008068	M.Vinod kumar	
12	321008077	S.Sarathchandra	
13	321008173	B.Nagendrayadav	MPC(E.M)
14	321008174	C.Hemadrireddy	
15	321008178	C.Akash	
16	321008180	C.Vijaykumar	

17	321008185	G.Babu	MPC(E.M)
18	321008193	J.Varshitha	
19	321008196	K.Sandeep	
20	321008199	K.Venkatagopi	
21	321008206	M.Shohith	
22	321008207	M.Vishnuvardan	
23	321008219	SAKE.Rohith	
24	321008225	T.Ganesh kumar	
25	321008237	Y.Baradwaj	
26	321008326	Bandila Madhu	MZC(E.M)
27	321008327	B.Deepak royal	
28	321008330	B.Sivani	
29	321008333	C.Dhanush	
30	321008344	K.Jeevan kumar	
31	321008356	Shaik Ayesha	

H.O.D Of The Department

HEAD
DEPARTMENT OF CHEMISTRY
S. G. S. ARTS COLLEGE
TIRUPATHI

TO
1.All teaching staff of chemistry
2.Department for circulation
3.Department for notice board

OM NAMOVENKATESAYA

TIRUMALA TIRUPATI DEVASTHANAMS:: TIRUPATI

S.G.S.ARTS DEGREE COLLEGE

DEPARTMENT OF CHEMISTRY

Sri. D. PARAMESWARA
M.Sc, M.Phil (Ph.D)
HOD OF CHEMISTRY

PHONE NO: 9490728655
Mail.ID:parameswara1964@gmail.com

DEPARTMENT OF CHEMISTRY			
REMEDIAL CLASSES			
TIME TABLE FOR THE ACADEMIC YEAR 2022-2023			
SEMESTER III & V(Odd semester)		DATE: 07/12/2022 TO 23/02/2023	
Name of the Lecturer	WEDNESDAY	THURSDAY	TIME
Dr.V.Venkatalakshmi	III	III	04:00 to 06:00
Dr.P.Suguna	V – 6B	V - 6B	04:00 to 06:00
Smt.P.Revathi	V – 7B	V – 7B	04:00 to 06:00

HEAD
DEPARTMENT OF CHEMISTRY
S. G. S. ARTS COLLEGE
TIRUPATHI

REGISTER OF ATTENDANCE

Name of the Institute: CHEMISTRY II B.Sc BBC, CBZ III Semester

FOR THE MONTH OF 2022-2023

Class: B.Sc Time 04 to 06 Pm Section:

SRI HARI TRADERS PRODDATUR ☎ 08564-252266

S.NO	HALL TICKET NO	NAME	CASTE GROUP
1	322008005	B. Aravind	BBC
2	322008007	Devendra naik. M	"
3	322008015	L. Jaya Prakash	"
4	322008016	M. Balagoiraiah	"
5	322008021	M. Jeevan	"
6	322008025	P. mukesh Rushi	"
7	322008029	P. Poojitha	"
8	322008030	S. sudheer	"
9	322008035	Y. suresh.	"
		CBZ	
1	322008043	G. Jyoshna	"
2	322008044	G. karthik	"
3	322008045	G. manohar babu	"
4	322008049	K. Raju	"
5	322008050	K. Sangeetha	"
6	322008051	K. Anjali	"
7	322008062	Shaik Ahmad Ali	"
8	322008065	T. Teja.	"

Lecturer signature

TEST 1	TEST 2	TEST 3	TEST 4
23/12	12	14	23/2/2023
12	AB	13	AB
10	17	11	AB
11	12	14	12
11	13	AB	10
12	AB	17	14
10	AB	11	13
11	14	12	10
12	13	15	12
18	13	14	13
AB	12	11	09
16	AB	15	12
10	16	AB	11
13	14	13	16
10	AB	AB	14
15	17	11	10
14	14	15	AB

II B.Sc S.G.S. Arts degree college TTD TIRUPATI

REGISTER OF ATTENDANCE

Name of the Institute: CHEMISTRY III MPC, MZC Semester December 2022 January 2023

FOR THE MONTH OF 2022-2023

Class: MPC, MZC III Time 04 to 6 Pm Section:

SRI HARI TRADERS PRODDATUR ☎ 08564-252266

S.NO	HALL TICKET NO	NAME	CASTE GROUP
1	322008138	Alangadu Rohith	MPC
2	322008139	A. mallikarjuna	"
3	322008142	A. Sanjay	"
4	322008143	B. Vishnu Vardan naidu	"
5	322008148	Chintha Naveen	"
6	322008150	D. Dakhu	"
7	322008159	K. Niranjan	"
8	322008166	M. Srinath	"
9	322008167	M. Naveen Anil	"
10	322008170	P. Pavan kumar	"
11	322008171	P. Sunil babu	"
12	322008172	P. mallikarjuna	"
13	322008179	Thumma Deva	"
14	322008182	Y. Harikrishna	"
		MZC	
1	322008268	C. Siva	"
2	322008270	E. Bhargavi	"
3	322008271	Gali Jahnavi	"
4	322008272	Golla madhu	"
5	322008283	M. Gajendra naik	"
6	322008285	M. Baby Priyanka	"
7	322008286	N. Renuka	"
8	322008291	P. Ramya	"
9	322008292	P. mahesh	"

Lecturer signature

TEST 1	TEST 2	TEST 3	TEST 4
10	14	16	AB
10	12	17	12
AB	15	14	11
10	AB	13	10
14	18	12	15
12	16	14	13
16	12	11	15
AB	13	16	AB
AB	15	13	11
14	12	11	AB
13	10	11	11
11	13	12	10
15	14	11	10
16	13	12	AB
13	14	12	AB
AB	13	16	12
10	12	13	11
AB	11	AB	AB
10	13	15	AB
16	15	17	10
11	AB	12	13
16	11	14	12
15	15	AB	12

IV S.G.S. Arts Degree College TTD TIRUPATI

REGISTER OF ATTENDANCE

Name of the Institute: CHEMISTRY CBZ, MZC, BBC V semester

FOR THE MONTH OF 2022-2023

Class: III B.Sc Time 04:00 06 Pm Section:

SRI HARI TRADERS
PRODDATUR
✆ 08564 - 252266

SL. NO.	ADMISSION NO.	NAME	CASTE Group	7/12	8/12	14/12	15/12	21/12	22/12	28/12	29/12	25/1	1/2	2/2	8/2	9/2	15/2	16/2	22/2	23/2	18	19	20	21	22	23	24	25	26	27	28	29	30	31	29/12/2022 TEST ①	25/1/2023 TEST ②	9/2 ③	23/2 ④
1	321008053	D. Narasimha Vardan	CBZ	X	X	X	X	AB	X	X	X	X	X	X	X	X	X	X	X	X															13	16	16	12
2	321008058	J. Radhika	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	AB	X															12	12	10	14
3	321008065	L. Praveen	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															AB	14	AB	11
4	321008066	M. Vinod kumar	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															16	15	13	10
5	321008077	S. Sarath chandra	"	X	X	X	X	X	X	X	AB	X	X	X	X	X	X	X	X	X															13	12	10	AB
			MZC																																	
1	321008326	Bandi lamadhu	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															18	12	12	16
2	321008327	B. Deepak Royal	"	X	X	X	X	X	X	AB	X	X	X	X	X	AB	X	X	X	X															13	11	15	13
3	321008330	B. Sivani	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															12	AB	12	10
4	321008333	C. Dhanush	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	AB	X	X															15	12	10	AB
5	321008344	K. Jeevan kumar	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															13	16	17	13
6	321008356	Shaik Ayesha	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															AB	12	16	10
																																			AB	
			BBC																																		
1	321008021	M. Kalyan	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															14	13	AB	11
2	321008023	M. Dheeraj	"	X	X	X	X	X	X	X	X	X	X	X	X	AB	X	X	X	X															16	11	10	13
3	321008024	M. Varaprasad	"	X	X	X	X	X	X	AB	X	X	X	X	X	X	X	X	X	X															13	15	AB	14
4	321008027	O. Pavan kumar Raju	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															AB	12	14	AB
5	321008029	P. Chand Basha	"	X	X	X	X	X	X	X	AB	X	X	X	X	X	X	X	X	X															11	12	13	12
6	321008035	S. Surendra baby	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	AB	X															10	AB	AB	15
7	321008037	S. Praveen	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															13	11	AB	11
		Lecturer Signature		W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W	W															W	W	W	W

S.G.S. Arts College, TTD, TIRUPATI

REGISTER OF ATTENDANCE

Name of the Institute: CHEMISTRY MPC V Semester - 6B

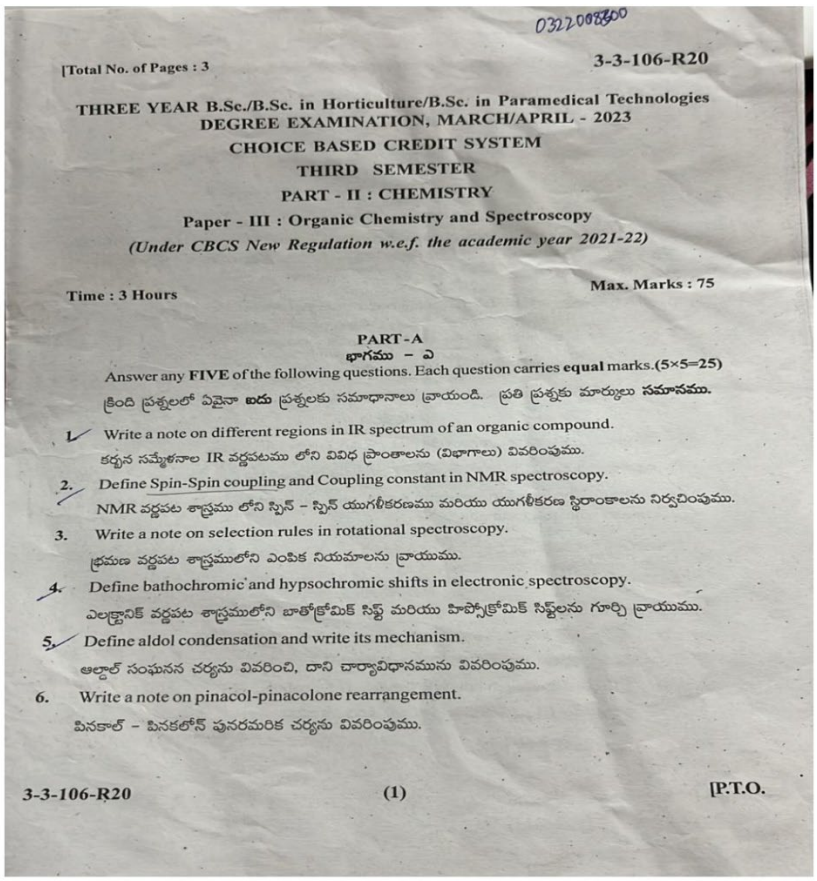
FOR THE MONTH OF 2022-2023

Class: III B.Sc MPC Time 04:00 6 pm Section:

SRI HARI TRADERS
PRODDATUR
✆ 08564 - 252266

S.No	HALLTICKET NO	ADMISSION NO	NAME	CASTE Group	7/12	8/12	14/12	15/12	21/12	22/12	28/12	29/12	25/1	1/2	2/2	8/2	9/2	15/2	16/2	22/2	23/2	18	19	20	21	22	23	24	25	26	27	28	29	30	31	29/12/2022 TEST ①	25/1/2023 TEST ②	9/2 ③	23/2 ④
1	321008178		B. Nagendra yadav	MPC	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X															12	11	AB	AB
2	321008174		C. Hemadri reddy	"	X	X	X	AB	X	X	X	X	X	X	X	X	X	X	X	X	AB																AB	10	14	13
3	321008178		C. Akash	"	X	X	X	X	X	X	X	X	X	X	AB	X	X	X	X	X	X																13	16	15	12
4	321008180		C. Vijaykumar	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																17	12	13	11
5	321008185		G. Babu	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																15	11	10	14
6	321008193		J. Varshitha	"	X	X	X	X	X	X	X	X	X	X	X	AB	X	X	X	X	X																14	13	12	15
7	321008196		K. Sandeep	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	AB																17	12	AB	12
8	321008199		K. Venkata gopi	"	X	X	X	X	X	X	AB	X	X	X	X	X	X	X	X	X	X																10	11	13	AB
9	321008206		M. Shakith	"	X	X	X	X	X	X	X	X	X	X	AB	X	X	X	X	X	X																12	AB	13	13
10	321008207		M. Vishnuvardan	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																AB	10	12	14
11	321008219		Sake Rohith	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	AB																AB	11	13	17
12	321008225		T. Ganesh kumar	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																AB	12	15	16
13	321008237		Y. Bharadwaj	"	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X																12	14	AB	10
			Lecturer Signature		P	P	P	P	A	P	P	P	P	P	A	P	P	P	P	P	P																P	P	P	P

RUBRICS



[Total No. of Pages : 3

3-3-106-R20

THREE YEAR B.Sc./B.Sc. in Horticulture/B.Sc. in Paramedical Technologies DEGREE EXAMINATION, MARCH/APRIL - 2023

CHOICE BASED CREDIT SYSTEM

THIRD SEMESTER

PART - II : CHEMISTRY

Paper - III : Organic Chemistry and Spectroscopy

(Under CBCS New Regulation w.e.f. the academic year 2021-22)

Time : 3 Hours **Max. Marks : 75**

PART-A
భాగము – ఎ

Answer any **FIVE** of the following questions. Each question carries **equal** marks.**(5×5=25)**
క్రింది ప్రశ్నలలో ఏవైనా **ఐదు** ప్రశ్నలకు సమాధానాలు వ్రాయండి. ప్రతి ప్రశ్నకు మార్కులు **సమానము.**

1. Write a note on different regions in IR spectrum of an organic compound.
కర్బన సమ్మేళనాల IR వర్ణపటము లోని వివిధ ప్రాంతాలను (విభాగాలు) వివరింపుము.
2. Define Spin-Spin coupling and Coupling constant in NMR spectroscopy.
NMR వర్ణపట శాస్త్రము లోని స్పిన్ – స్పిన్ యుగ్మీకరణము మరియు యుగ్మీకరణ స్థిరాంకాలను నిర్వచింపుము.
3. Write a note on selection rules in rotational spectroscopy.
భ్రమణ వర్ణపట శాస్త్రములోని ఎంపిక నియమాలను వ్రాయుము.
4. Define bathochromic and hypsochromic shifts in electronic spectroscopy.
ఎలక్ట్రానిక్ వర్ణపట శాస్త్రములోని బాతోక్రోమిక్ సిఫ్ట్ మరియు హిప్సోక్రోమిక్ సిఫ్ట్లను గూర్చి వ్రాయుము.
5. Define aldol condensation and write its mechanism.
ఆల్డాల్ సంఘనన చర్యను వివరించి, దాని చార్యావిధానమును వివరింపుము.
6. Write a note on pinacol-pinacolone rearrangement.
పినకాల్ – పినకలోన్ పునరమరిక చర్యను వివరింపుము.

7. Define active methylene compound and suggest two suitable examples.

చురుకైన మిథిలీన్ సమూహ సమ్మేళనాలను నిర్వచించి, ఏవేని రెండు ఉదాహరణలిమ్ము.

8. Write a note on stereo chemistry of SN^2 reaction.

SN^2 చర్య యొక్క త్రిమితీయ రసాయన శాస్త్రమును గూర్చి వ్రాయుము.

PART - B
భాగము - బి

Answer **All** the questions. Each question carries **equal** marks. (5×10=50)

అన్ని ప్రశ్నలకు సమాధానములు వ్రాయుము. ప్రతి ప్రశ్నకు మార్కులు **సమానము.**

9. a) Write notes on

i) Energy levels of different molecular orbitals (σ, π, n).

(σ, π, n) అణు ఆర్బిటాల్‌ల శక్తి స్థాయిలను గూర్చి వ్రాయుము.

ii) Chromophore with suitable examples.

క్రోమోఫోర్‌ను నిర్వచించి , తగిన ఉదాహరణలిమ్ము.

(OR/లేదా)

b) Explain ^1HNMR spectrum of ethanol and 1,1,2-tribromo ethane.

ఇథనాల్ మరియు 1,1,2-ట్రైబ్రోమో ఈథేన్ ల ^1HNMR వర్ణపటమును విశదీకరించుము.

10. a) How are Woodwards rules useful for the calculation of λ_{max} of conjugated dienes. Discuss with few examples.

సంయుగ్మ డైఈన్‌ల λ_{max} విలువలను లెక్కించడానికి ఉడ్ వర్డ్ నియమాలు ఏ విధంగా ఉపయోగపడతాయో తగిన ఉదాహరణలతో వివరింపుము

(OR/లేదా)

b) Write a note on

i) Selection rules in vibrational spectroscopy.

కంపన వర్ణపట శాస్త్రము లోని ఎంపిక నియమాలు

ii) Effect of hydrogen bond IR spectrum of alcohols.

ఆల్కాహాల్‌ల IR వర్ణపటముపై హైడ్రోజన్ బంధ ప్రభావము

11. a) Describe different types of nucleophilic substitution reactions of alkyl halides with suitable mechanisms.

ఆల్కైల్ హాలైడ్‌లు జరుపు వివిధ రకాల న్యూక్లియోఫిలిక్ ప్రతిక్షేపణ చర్యలను చర్యావిధానముతో సహా వివరింపుము.

(OR/లేదా)

b) Write notes on

i) Benzoin condensation.

బెంజాయిన్ సంక్షేపణము

ii) Perkin's reaction.

(పెర్కిన్ చర్య) లను గూర్చి వ్రాయుము.

12. a) Write notes on

i) Preparation of alcohols.

ఆల్కాహాల్‌ల తయారీ పద్ధతులు

ii) Acidic nature of phenols

ఫినాల్స్ ఆమ్లత్వ స్వభావము గూర్చి వ్రాయుము.

(OR/లేదా)

b) Write notes on

i) Esterification of carboxylic acids with mechanism.

మధ్యస్థత్వంలో కార్బాక్సిలిక్ ఆమ్లాల ఎస్టరిఫికేషన్ చర్య చర్యావిధానము.

ii) Halogenation of carboxylic acids.

కార్బాక్సిలిక్ ఆమ్లాల హాలోజనీకరణమును గూర్చి విశదీకరించుము.

13. a) Write notes on

i) Haloform reaction with mechanism.

హాలోఫామ్ చర్య మరియు చర్యా విధానము

ii) Acid catalyzed ester hydrolysis with mechanism.

ఆమ్ల ఉత్ప్రేరిత ఈస్టర్ జల విశ్లేషణ చర్య మరియు చర్యా విధానములను గూర్చి వ్రాయుము.

(OR/లేదా)

b) Describe the principles involved in ^{1}HNMR spectroscopy.

^{1}HNMR వర్ణపట శాస్త్రము లోని ప్రధాన సూత్రాలను విశదీకరించుము.

UNIT - 4 V - Semester

SPECTROPHOTOMETRY

Contents: Principle, Instrumentation: Single beam and double beam spectrometer, Beer-Lambert's law – Derivation and deviations from Beer-Lambert's law, applications of Beer-Lambert's law – Quantitative determination of Fe^{+2}, Mn^{2+} and Pb^{+2}.

Electromagnetic radiations:

Radiations which are having characteristics as that of the wave are called electromagnetic radiations.

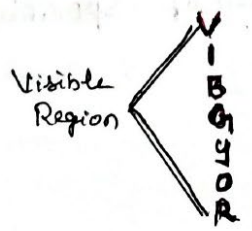
Eg:- X-rays, γ-rays, radiowaves etc.

- These radiations do not require any medium for propagation.
- They can travel even in vacuum.
- They are dual in nature (Both particle & wave nature)

The interaction of EMRs' with matter results in the formation of spectra. The study of spectra is called spectroscopy.

The arrangment of all types of radiations in the order of their increasing wavelengths or decreasing frequencies is known as electromagnetic spectreum.

COSMIC rays	γ-rays	X-rays	UV rays	Visible	IR	MICRO	RADAR	TV	NMR



3800A° (or) 400nm

7600A° (or) 800nm.

When a beam of light which has intensity I_0 falls upon a homogeneous medium, certain amount of the light comes out of the medium from other side (transmitted) is less in intensity than the light that interacted with the medium. It is due to a portion of light will be reflected, a portion of light is absorbed and remaining is transmitted.

If intensity of incident light is I_0, reflected light is I_r, light absorbed is I_a and light transmitted is I_t.

Then, $I_0 = I_r + I_a + I_t$

For air-glass interface (when we use glass cells) the I_r will be about 4% of I_0, If we use a control cell such as reference, we can neglect I_r

Hence, $I_0 = I_a + I_t$

The relation which give the change of absorption with thickness and concentration of medium, is governed by Beer-Lambert's law.

It is the fundamental law of SPECTROPHOTOMETRY

Beer- Lambert's Law:

- **Lambert's law:** This law was proposed by Lambert in 1760. It is applicable for homogeneous solutions.

It states that, when monochromatic light passes through a transparent medium the rate of decrease in intensity with thickness of medium is proportional to the intensity of the light that fall on medium. This is equivalent to stating that the intensity of the emitted light decreases exponentially as the thickness of the medium increases arithmatically ie any layer of given thickness of medium absorb the same fraction of the light incident upon it.

Intensity of Incident light = I_0

Pathlength = x

$$\therefore -\frac{dI}{dx} \propto I$$

$$-\frac{dI}{dx} = kI$$

Then $$\boxed{\frac{dI}{I} = -k\,dx}$$

- **Beer's law:** When a beam monochromatic light passes through a solution its intensity decreases with the intensity of incident light and depends on the concentration of the medium.

$$-\frac{dI}{I} \propto dc, \quad \frac{dI}{I} = \epsilon dc$$

$$\therefore \frac{dI}{I} = -\epsilon dc$$

ϵ = Molar absorptivity constant.

Integrating between limits; $I = I_0$ to I, $c = 0$ to c

$$\frac{dI}{I} = -kcdl$$

$$\frac{dI}{I} = -kcdl$$

$$\int_{I_0}^{I} \frac{dI}{I} = -kc\int_{0}^{l} dl$$

$$\ln \frac{I_t}{I_0} = -kcl$$

$$\ln \frac{I_0}{I_t} = kcl$$

Using log,

$$2.303 \log \frac{I_0}{I} = \frac{k}{2.303} cl$$

$$\log \frac{I_0}{I} = \left(\frac{k}{2.303}\right) cl = \epsilon cl$$

$$\therefore A = \epsilon cl$$

where $A = \log \frac{I_0}{I}$

Limitations of Beer-Lambert's law:

1. This law is applicable for light of single wavelength
2. Solution should be of uniform concentration.
3. A graph is plotted between absorbance and concentration, which gives a straight line passing through the origin.
4. Chemical deviation: The analyte should not undergo either association (coagulation) or dissociation, which causes deviation in Beer's law. It is also not applicable in case of suspensions.
5. Instrumental deviation: Only monochromatic light is to be used.

Transmittance:

Ratio of the intensity of the light transmitted by the sample 'P' to the intensity of the incident on the sample P_0.

$$\therefore T = \frac{P}{P_0}$$

In percentage (%)

$$\%T = \frac{P}{P_0} \times 100$$

Absorbance: It is defined as the log base of the reciprocal of transmittance.

$$A = \log \frac{1}{T}$$

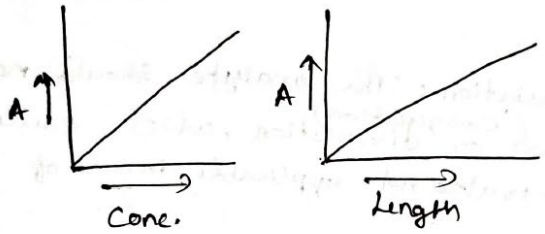
It is the negative log-base of transmittance.

$$A = -\log T$$

$$T = \frac{P}{P_0}$$

$$A = -\log \frac{P}{P_0} = \log \frac{P_0}{P}$$

When $P = P_0$, incidence = emitted light thus no absorption. Absorbance increases with increase in the conc. of solution and length of the medium.



Molar absorptivity:

$$A = \epsilon c l$$

c = Conc. expressed in moles per litre

l = pathlength, expressed in cm

A = absorptivity of a solution.

Then the proportionality constant is called the molar absorptivity or molar extinction coefficient (ϵ)

$$\epsilon = \frac{A}{cl}$$

Units for ϵ = $mole^{-1} cm^{-1}$

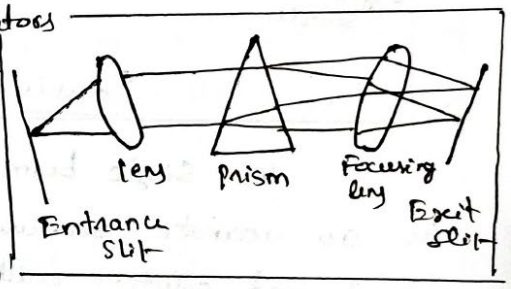
Instrumentation:

A spectrophotometer is a device which detects the % transmittance of light radiation when light of certain intensity and frequency is passed through the sample.

It is an assembly of
1. Light source
2. Monochromator
3. cell
4. Detector
5. Amplifier
6. Recording device.

1. **Light Source:** Tungsten filament lamp is rich in red radiation Deuterium hydrogen discharge lamp covers the region below it. These two sources covers the entire UV and visible region.

2. **Monochromator:** The monochromators absorb the radiation except that is required. Prism is used as monochromator. As the prism is rotated in different angles, different monochromatic radiations are obtained.

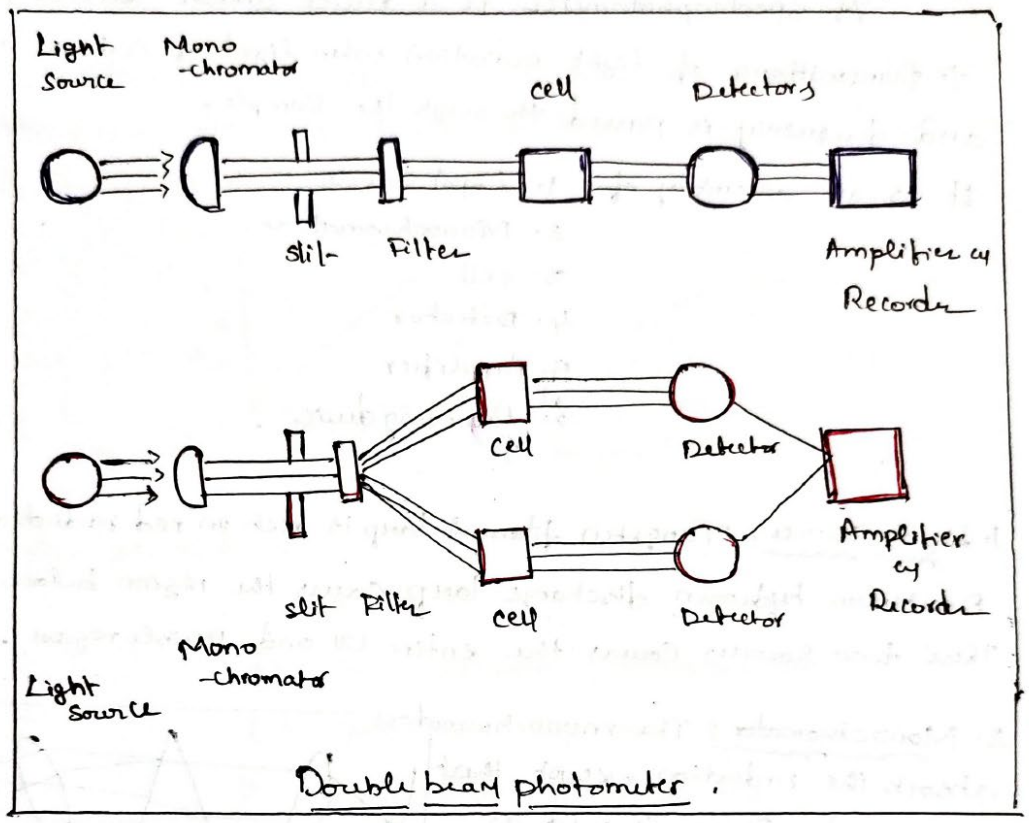


3. **cell:** The solvent is taken in the cell. Silica and quartz cells are used.

4. **Detector:** photovoltaic cells or phototubes are used as detectors. They convert the transmitted light into electrical signals.

5. **Amplifiers and Recording device:** Amplifier enlarges the result and records in the form of graph.

Single Beam photometer



Double beam photometer.

In Single beam method, the measurement may not be so accurate because the intensity of radiation on solvent and solution will not be equal due to voltage fluctuation. Thus the absorption may not be correct and hence a double beam method where the two beams of equal intensity fall on solvent and solution simultaneously

Here the light beam splits into two beams of equal intensity fall on solvent and solution simultaneously, and the absorbance is measured. The detector is measured in such a way that the absorbance of solvent is ignored.

Applications:

(1) **Determination of Manganese in $KMnO_4$:**

Procedure:

1. Preparation of standard solution of $KMnO_4$: Prepare 0.004M $KMnO_4$ solution in 100ml standard flask. Make it upto the mark with 0.5N H_2SO_4, shake it well.

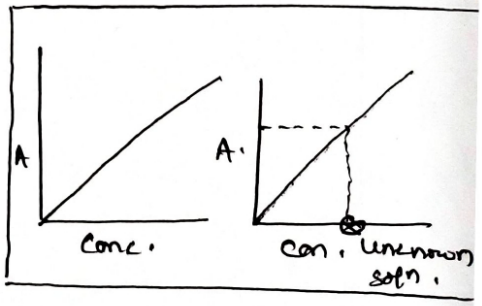
2. Preparation of different Conc. of solutions: Take different volumes of $KMnO_4$ solution in 25ml standard flask and make it upto the mark and shake well.

3. Calculation of λ_{max}: Measure the absorbance of any one of the above prepared solutions at different wavelengths.

The λ_{max} of this solution is 520nm. Measure the absorbance of Any one of the above ~~prepared solutions~~ at ~~different~~ → all prepared solutions of this λ_{max} using 0.5N H_2SO_4 as reference cell.

Determination of Mn in an unknown Sample:

Take unknown volume of $KMnO_4$ in a 25ml standard flask and make it upto the mark. shake it well. Measure the absorbance of this solution at 520nm.



Using calibration curve, it is possible to know the amount of Mn in unknown solution.

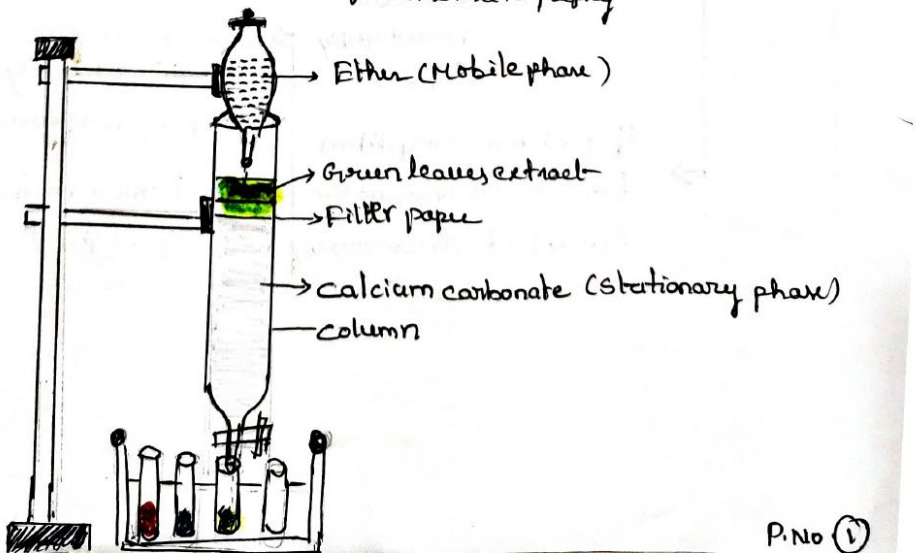
UNIT - I

CHROMATOGRAPHY

Introduction and classification.

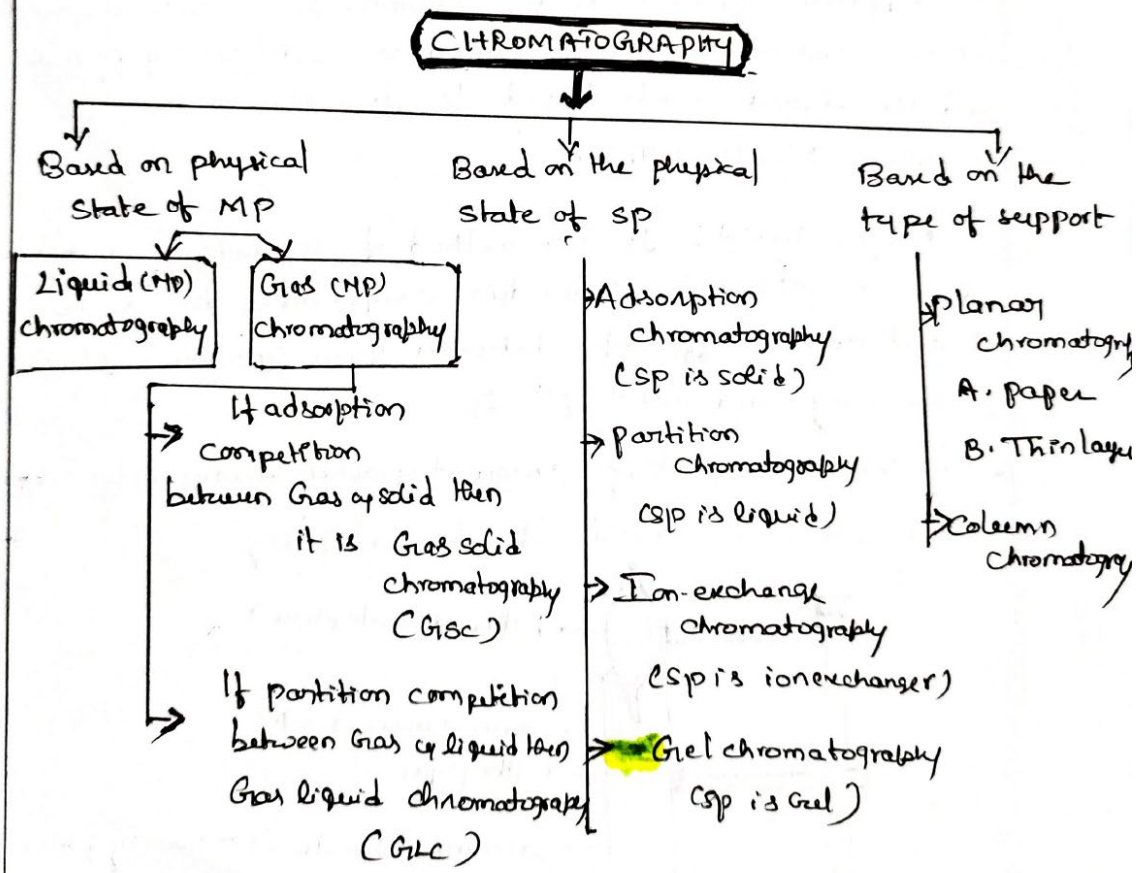
'CHROMATOGRAPHY' is a separation technique was first invented by M. TSWETT, a botanist in 1906 and he was successful in separating chlorophyll, xanthophyll and several other substances by percolating vegetable extracts through a column of calcium carbonate, acts as an adsorbent and the different substances got adsorbed to different extents and thus gave rise to colored bands at different positions on the column. Since calcium carbonate remains stationary, that is called as STATIONARY PHASE and the liquid which helped to flow through the column is called MOBILE PHASE.

- DEFINITION: It is a method of separating a mixture of components into individual components based on distribution co-efficient between two immiscible phases. [Stationary and mobile phase]
- In Greek terminology chromatography means "color writing"
  M. Tswett is the "Father of chromatography"



- **STATIONARY PHASE:** a. It is an inert solid bed.
  b. It is immobile
  c. It is packed either in the column or on the plate as thin film.
- **MOBILE PHASE :** a. It is either liquid or gas
  b. It flows continously through the SP.

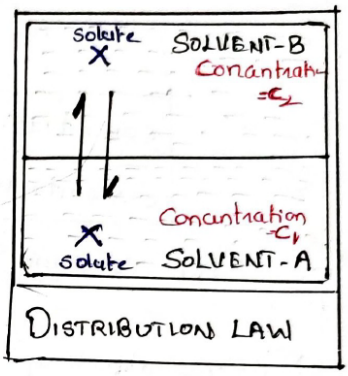
CLASSIFICATION:



PRINCIPLE OF CHROMATOGRAPHY:

The basis for all forms of chromatography is partition or distribution co-efficient. It is indicated with 'K_D'.

Distribution law: If two immiscible solvents A and B and a solute X soluble in both solvents is taken then the solution get distributed between the two liquids. Molecules of X pass from solvent A to B and from B to A until a dynamic equilibrium



DISTRIBUTION LAW

The rate at which molecules of X passes from solvent A to B and vice versa is balanced.

Thus at equilibrium the ratio of the concentration of the substance in the two liquids is always constant at constant temperature.

$$\frac{\text{Con. of X in A}}{\text{Con. of X in B}} = \text{constant} = \frac{C_1}{C_2} = K_D$$

where K_D is the distribution constant or distribution co-efficient

Examples: 1. Distribution of Iodine between mixture of Carbondisulphide and water.

2. Distribution of Succinic acid between ether and water.

Nernst Distribution law: The law states that,

a solute distributes itself between the two immiscible solvents in such a way that the ratio of the concentration of the solute in two solvents is constant at constant temperature provided that the solute has the same molecular state in both the solvents.

$$\frac{\text{Concentration of X in solvent A}}{\text{Concentration of X in solvent B}} = \frac{C_1}{C_2} = K_D$$

The constant K_D is called the distribution coefficient.

Factors affecting the law:

1. Constant Temperature: The temperature must remain constant throughout the experiment. This is due to the fact that the solubility of a solute changes with temp and the change may not be the same in two solvents.

2. Existence of similar molecular species of solute in the solvent: The solute should neither undergo association nor dissociation in either of the solvents, nor it should combine with any of the solvents.

3. Immiscibility: The two solvents should be immiscible or only very sparingly soluble in each other. The extent of mutual solubility of the solvents should not change by addition of solute to them.

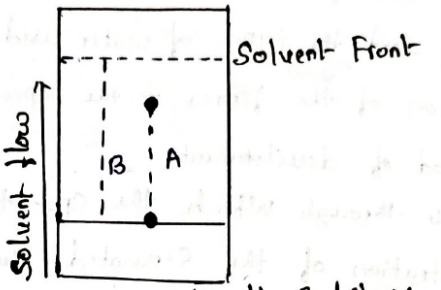
4. Dilute solution: The amount of solute added should be small. This is because of the fact that in certain cases the solute added effects the mutual solubility of the solvents.

Q

(1) What is R_f ? What are the factors affecting R_f values ?

Definition:- It is defined as the ratio of the distance travelled by the compound at its point of maximum concentration to the distance travelled by the solvent. R_f = Retardation factor value.

R_f value has no unit.



$$\therefore R_f = \frac{\text{Distance travelled by the substance}}{\text{Distance travelled by the Solvent.}}$$

$$R_f = \frac{A}{B}.$$

i) Sometimes the solvent front runs off the paper. In that case R_f is determined by comparing with some standard substance.

$$\therefore R_f = \frac{\text{Distance travelled by the substance}}{\text{Distance travelled by the standard substance.}}$$

ii) R_f value is different for different compounds just like MP; BP and other physical constants different for different compounds.

Eg:- Arginine −0.34
D-Glucose − 0.39
oxalic acid − 0.18
zinc −0.105
p-cresol − 0.92

} R_f values with different solvent systems.

iii) R_f is the function of the partition co-efficient. Values always less than 1.

iv) If the distribution co-efficient is known for the system, then R_f is calculated very easily. $R_f = \frac{A_l}{(A_l + \alpha A_s)}$; $\alpha = \frac{A_l}{A_s}\left[\frac{1}{R_f} - 1\right]$

Where, A_l = cross section area of the MP α = Distribution coefficient of two phases.
A_s = cross section area of the SP

Factors affecting the R_f Value:-

1. Temperature
2. Quality of the paper used.
3. The pH of the solution.
4. The distance through which the solvent has moved on the paper.
5. The quality and the type of water used.
6. The direction of the fibres of the paper.
7. The method of development.
8. The distance through which the spot travels.
9. The concentration of the separated substances.
10. The method of drying, locating the colourless substances, and many other operations involved in the method.
11. Irreversible adsorption on paper.
12. The R_f value obtained is due to two forces

A) Propelling forces

This assists in the propagation of the substance in the direction of the flow of the solvent.

B. Retarding forces

This type of force tries to drag the substances behind towards their point of application.

(2) In what way TLC is superior to paper and column chromatography?

Advantages of TLC:-

1. In TLC Separation is sharpe.
2. It requires less time and less amount of sample.
   (15-50mts) (0.4 mg)
3. The diffusion of the individual spots is less.
4. Acids can be safely sprayed on TLC plates for identification which is not possible with other methods.
5. TLC plates can be heated to higher temperatures without causing any damage to it.
6. In TLC Varied no. of adsorbents are used not like in PC limited only to cellulose.
7. The capacity of thin layer of Adsorbent is higher than that of paper.
8. It is possible to coat the plates with variety of corrosive reagents that would destroy PC.
9. The method has immense value for compounds like alkaloids, aminoacids, peptides, steroids, antibiotics, carbohydrates, dyes, insecticids, vitamins and in the field of inorganic chemistry.
10. Radio isotopes like H^3 (Tritium), P^{32}, S^{35}, I^{131} have been used Successfully.

11. Biological changes like FERMENTATION can be studied by this method.

12. This method is successful in the incorporation of C^{14} labelled metabolites into lipids.

(B) What is an Adsorbent? What are the different adsorbents used in Chromatography?

Adsorption - Defi:- Adsorption is a surface phenomenon where the molecules are present (or) absorbed in the superficial layer only. The substances which show this phenomenon are called adsorbents. There are of different types.

S.No.	Adsorbent	Nature of the surface active site.
1.	Silica gel	Acidic
2.	Alumina	Acidic and basic sites
3.	Magnesium Silicate	Acidic
4.	Kieselguhr	Neutral
5.	Charcoal	Neutral and Acidic
6.	Sucrose	Neutral
7.	Starch	Neutral.

Adsorbents are finely-divided, porous particles with large surface areas ~50 m^2/g. These are poured in the column in two methods

Dry-packing Method – Dry powder taken directly into the column

Wet-packing Method – Made into a slurry using an organic solvent and then poured into the column and the solvent drained off.

Different forces are acting for strong packing of the adsorbent.

a) Vanderwaals' forces – Intermolecular forces which hold non-polar molecules together in the liquid (or) solid state.

b) Inductive forces:- (Dipole forces):- These are forces shown by the organic compounds such as C=O, C–O, C–Cl, ~~C–OH~~ C–NH_2 etc with strong permanent dipole. Each compound may have different binding strengths to the stationary phase.

c) Hydrogen bonding forces:- These are weak intermolecular forces which bind with the stationary phase surface groups. ~~These are~~ These are stronger than Vanderwaals' and dipole forces.

Eg:- -OH, NH_2, COOH etc.

Some commonly used adsorbents:-

1) Silica gel:- General formula – $SiO_2 \times H_2O$. It is also called as Silica, ~~Silicic~~ (or) Silicic acid. The surface of SiO_2 is covered by hydroxyl groups.

Free hydroxyls Bound and reactive hydroxyl

Alumina, acidic (Al_2O_3) – Hydrated alumina $Al_2O_3 \times H_2O$ heated to 300-400°C, most of the water is drawn off, with the remaining H_2O on the surface experiment is carried out. It is known as activated alumina. pH = 4 so it is acidic Al_2O_3.

Alumina, basic (Al_2O_3) – Heating the hydrated $Al_2O_3 \cdot xH_2O$ to 800-1000°C removes the total water, gives hydroxyl free Al_2O_3. The oxide ions now give the basic properties.

(4) SOLVENT SYSTEMS:- The compounds in the mixtures have different adsorption strengths towards the stationary phase. Their actual separation can be done only when a mobile phase moves through the stationary phase. The mobile phase is a pure organic solvent (or) a solvent mixture called as ELUENT.

The common organic solvents arranged in the increasing order of their POLARITY (dielectric constant) used as mobile phase.

The arrangement of the solvents in the increasing order of polarity is known as Elatotropic series

Hexane Cyclohexane Benzene CH_2Cl_2 $CHCl_3$ EtOAc Acetone EtOH MeOH Water AcOH	Solvents arranged in the increasing order of polarity (or) increasing solvent power to dissolve the compounds adsorbed to the stationary phase.

S.G.S ARTS COLLEGE, TTD, TIRUPATI

DEPARTMENT OF CHEMISTRY

II[nd] BSc III[rd] semester Important Questions

UNIT-I

CHEMISTRY OF HALOGENATED HYDROCARBONS

1. Write the preparations and properties of alkyl halides.?
2. What are nucleophilic substitution reactions ? How they are classified?
3. Write the mechanism of SN1 reaction?
4. Write the mechanism of SN2 reaction?

ALOCHOLS & PHENOLS

1. Write the preparation methods of alcohols?
2. Write about the mechanism of following reactions?
   A. Kolbe's schmidth reaction
   B. Riemer-tiemer reaction
   C. Pinacol-Pinacolone rearrangement
   D. Fries rearrangement reaction
   E. Claisen rearrangement reaction

UNIT-II

CARBONYL COMPOUNDS

1. Write about the mechanism of following reactions?
   A. Aldol condensation reaction
   B. Benzoin condensation reaction
   C. Caisen-Schmidthreactiont
   D. Perkin reaction
   E. Cannizaro's reaction
2. write the preparations of carbonyl compounds?
3. Write a short note on ?
   a. Haloform reaction
   b.M.P.V reactionc. Knoevengel reaction

UNIT-III

CARBOXYLIC ACID SAND THEIR DERIVATIVES

1. Write the preparations of carboxylic acids
2. Write the chemical properties of carboxylic acids

3.Write a short note on

a. Esterification reaction
b. Claisen condensation
c. Reformasky reaction
d. Curtius rearrangement
e. Huns-Diecker reaction
f. Arndt – Eistert synthesis
g. Hell- Volhard – Zelinsky reaction

UNIT-IV

SPECTROSCOPY

1. Explain the types of electron transitions ?
2. Explain about I.R spectroscopy and different types of vibrations causes by I.R radiation ?
3. Write a note on enery level of simle harmonic oscillator and anharmonicoscillator ?
4. Explain about splitting of signal and spin-spin couping ?

UNIT-V

APPLICATIONS OF SPECTROSCOPY

1.Write the application of I.R spectroscopy?
2. Write the application of U.V spectroscopy?

S.G.S ARTS COLLEGE ,TIRUPATHI

DEPARTMENT OF CHEMISTRY

BSC –III, SEMESTER-V , PAPER-7B COURSE

UNIT-I

CHROMATOGRAPHY

1. Write a notes on chromatography separations ?
2. Briefly explain the classification of chromatography methods ?
3. What is eluotropic series ?

4.What is chromatography ? Explain ?

5.What is meant by Rf values ? Explain . Mention some of the factors on which the Rf value of a compound depends ?

UNIT – II

TLC AND PAPER CHROMATOGRAPHY

1.Explain the experimental procedure of paper chromatography ?

2. Mention some of the applications of paper chromatography ?

3.Explain the general procedure of thin layer chromatography (TLC) ?

4.Eplain the Radial or horizontal method of paper chromatography ?

UNIT – III

COLUMN CHROMATOGRAPHY

1.Explain column chromatography in detail ?

2.What is HPLC ? Explain about the theory and principle involved in High pressure Liquid chromatography (HPLC) ?

3.List the names of some of the most commonly used adsorbents in column Chromatography ?

4.Write about the classification of High – Perfomance Liquid Chromatography

(Instrumentation) ?

UNIT –IV

SPETROPHOTOMETRY

1.State and explain the Lambert's law and Beer – Lambert's law or Drive Beer – Lambert's law ?
2.Write about the spectrophotometer ?
3.What are the limitations of Beer – Lambert's law ?
4.What are single beam and double beam spectrophotometers ? Briefly explain ?

UNIT-V
ATOMIC SPECTROSCOPY
1.Write an essay on atomic spectroscopy ?
2.What are single beam and double beam spectrophotometers ? Briefly explain .
3.Briefly explain the principle and instrumentation of atomic Atomic Emission Spectroscopy ?

S.G.S ARTS COLLEGE TIRUPATHI

DEPARTMENT OF CHEMISTRY

III BSC, V SEMESTER, PAPER -6B COURSE

UNIT – I

QUANTITATIVE ANALYSIS – 1

1.Write a brief introduction on analytical methods in chemistry ?

2. Briefly explain various concentration terms used in volumetric analysis . Give examples ?

3.Write the note on different types of standard solutions used in analytical chemistry ?

4.Write about the fallowing apparatus

a)Volumetric flask b) Burrete c)Pippete d)Beaker e)Measuring cylinder .

UNIT - II

QUANTITATIVE ANALYSIS -2

1.Explain the principle involved in volumetric methods of anaiysis ?

2.Explain the principle for selection of indicators in acid – base titrations?

3.Explain the Acid-Base Titrations and the choice of indicators in Acid-Base Titrations with the help of titration curves ?

4.Discuss the difeerent theories of acid-base indicators ?

5.Write about the " Coagulation" and " Pepetization" and bring out the differences between the two?

UNIT – III

TREATMENT OF ANALYTICAL DATA

1.What is accuracy? Exaplain with examples ?

2.What is precision. Explain its importance ?

3.Explain Absolute Error,Relative Error and Percentage Error with necessary examples ?

4.What is the standard deviation? How is it calculated ?explain with examples ?

UNIT- IV

SEPERATION TECHNIQUES

1.Explian the distribution of law ?

2.Explain the Craig's counter current method ?

3.Explain the method of steam distillation and distillation under reduced pressure ?

4.Write about the " Regenaration" of the resin ?

UNIT –V

ANALYSIS OF WATER

1.Write notes on Turbidity, dissolved solids and pH of water ?

2.Brieflyexaplain the estimation of chloride present in water by Mohr's method ?

3. Write a brief notes on water treatment methods ?

4.Write about water softening ?

5.Write a notes on the hard ness of water ?

S.G.S. ARTS DEGREE COLLEGE,TTD,TIRUPATI

DEPARTMENT OF CHEMISTRY

II-B.sc III SEMESTER

DATE : 28/12/2023

INTERNAL CLASS TEST FOR SLOW LEARNERS

SECTION-A

I. Answer any one question **1x5 = 5M**

1. Explain reamer-timer reaction?
2. Describe the application of uv-visible spectroscopy?\

SECTION-B

II. Answer any two questions **2x10 = 20M**

1. Write about types if transitions?
2. Explain the types of vibrations?

3. (a) Kolbe schmidthraction
   (b) AZO coupling reaction

S.G.S. ARTS DEGREE COLLEGE,TTD,TIRUPATI

DEPARTMENT OF CHEMISTRY

III-B.sc V SEMESTER- 6B PAPER

DATE : 06/07/2023

INTERNAL CLASS TEST FOR SLOW LEARNERS

SECTION-A

I. Answer any one question **1x5 = 5M**

1. Write any two methods of preparation of carbony compounds?
2. Write the application of IR spectroscopy?

SECTION-B

II. Answer any two questions **2x 10= 20M**

1. Explan the following
   (a) Cannizaras reaction
   (b) Perkin's reaction
2. Write a note on energy level of simple harmonic oscillator and an harmonic oscillator?
3. Explain about splitting at signals & spins pin couping?

S.G.S. ARTS DEGREE COLLEGE,TTD,TIRUPATI

DEPARTMENT OF CHEMISTRY

III-B.sc V SEMESTER- 7B PAPER

DATE : 29/12/2023

INTERNAL CLASS TEST FOR SLOW LEARNERS

SECTION-A

I. Answer any one question **1x5 = 5M**

1. What are the limitation of Beer-lambert's law?
2. What is relation between absorbance and transmittance of a solution?

SECTION-B

II. Answer any two questions. **2 x10 =20M**

1. Briefly Explain the classification of chromatography methods?
2. How the Rp 0 value of a compound is determined using paper chromatography?
3. Explain the column chromatography?

Tirumala Tirupati Devasthanams Degree & PG Colleges, Tirupati.

S.V. ARTS COLLEGE / ~~S.P.W.~~ COLLEGE / S.G.S. ARTS COLLEGE

Name of the Examination: Internal Exam

Name of the Student : Thumma Deva

Class : IIB.Sc. Group : M.P.C. Medium : E.M

No. of Additional sheets used

Date : 28/12/2023

Roll No. : 322008179

Subject : CHEMISTRY

Paper : III. Semester

Q.Code :

Questions

15/25 25 marks

(1) Write about types of transitions? - 10m

(2) Explain the types of vibrations? - 10m

(3) (a) Kolbe Schmidth reaction? - 10m

(b) Azo coupling reaction?

(4) Explain Reimer - Tiemer reaction - 5m

(5) Describe the Applications of Uv-visible spectroscopy? - 5m

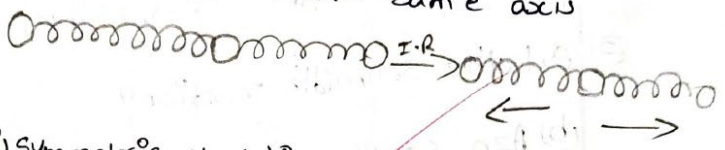
Answers

2A, IR Spectroscopy is one of the most advanced techniques to investigate the structure of organic compounds the wave length range of I.R radiation is 800nm - 20,000 nm Generally, IR Spectrum is described in terms of wave number which is the reciprocal of wave

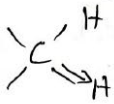
$[\bar{V} = \frac{1}{\lambda}]$

Principal :- The energy associated with I.R radiation is less than that of U.V and visible radiation Hence the electrons to higher energy levels as in U.V - Visible spectroscopy

(i) Stretching vibrations :- By absorbing I.R radiation bonds undergo stretching but atoms remain on the same axis



(i) Symmetric stretching :- In this case atoms are stretched in the same direction with respect to a particular atom



(ii) Assymmetric stretching :- In this case atom approaches the central atom and the other move away from it (shown by arrow)

3A) Azo coupling reactions :-

Phenols couple with diazonium salts in mild alkaline solution to form hydroxyazo compounds

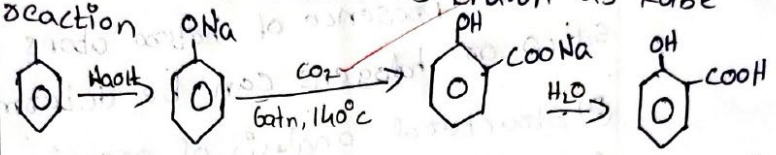
Benzenediazanium Chloride

Phenol

P-Hydroxyazobenzene

B. Kolbe-Schmidt reaction :-

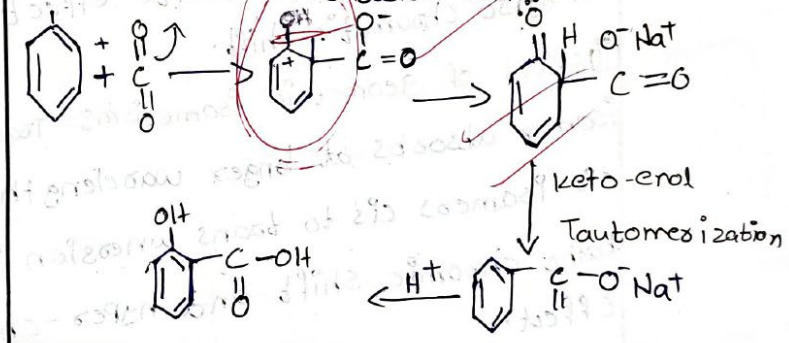
When sodium salt of phenol is heated with carbon dioxide gas at 120-140°C under pressure [6-7 atmospheres) a carboxyl group is introduced mainly in the ortho position with respect to the phenolic group to form 2-hydroxy benzoates. This reaction is known as kolbe reaction



Salicylic Acid

mechanism :-

The mechanism of kolbe reaction is to involve the attack of carbon dioxide on the highly reactive phenoxide ion.



5A) A) Qualitative & Quantitative Analysis :-

It is used for characterizing aromatic compounds and conjugated olefins it can be used to find out molar concentration of the solute under study

B) Detection of Impurities :-

It is one of the important method to detect impurities in organic solvents

additional Peaks can be observed due to impurities in the sample and it can be compared with that of standard raw material

(C) Structure elucidation of organic compounds:-

The presence or absence of unsaturation The presence of hetero atoms like S, N, O or halogens can be determined

(D) Structural analysis of organic compounds:

(i) Effect of conjugation :- Extended conjugation shifts the max to longer and reduction of the compond or saturation of double bonds leads to the opposite effect ie, hypso chromatic shift.

(ii) Effect of geometric isomerism :- Trans isomer absorbs at longer wavelength than cis isomers cis to trans conversion is batho chromic shift and hyper-chromatic effect.

Alkyl substitution :- shifts the max to longer wave length

(iv) Number of rings :- addition of rings causes bathochromic shift.

Tirumala Tirupati Devasthanams Degree & PG Colleges, Tirupati.

~~S.V. ARTS~~ COLLEGE / ~~S.P.W.~~ COLLEGE / S.G.S. ARTS COLLEGE

Name of the Examination: Remedial Internal Test Date : 28/02/2023

Name of the Student : .. C. Akash ..... Roll No. : 32100817S

Class : III B.Sc Group : MZC Medium : EM Subject : CHEMISTRY

Paper : V Semester Paper-B

No. of Additional sheets used [ ] Pb. 13/25 Q.Code : .....

Q Answer any two questions of 2x10=20m

1 Briefly explain the classification of chromatography methods?

2 How the Rf value of a compound is determined using paper chromatography?

3, Explain the column chromatography?

II Answer the any one question 1x5=5m

4, what are the limitations of Beer-Lambert's law.

5, what is relation between absorbance and transmittance of a solution?

Answers:

1 Ans Q 2 Every chromatographic technique involves two phases, the stationary phase and the mobile phase. The chromatographic methods of analysis are classified by different features, namely by the state of aggregation of the phase used by the nature of sorbate - & sorbent interaction, by the technique used etc.

According to separation mechanism, chromato methods are classified as adsorption chromatography, Partition chromatography, Ion-exchange chromatography Precipitation chromatography etc.

According to technique of carrying out the operation, chromatography has been classified as thin layer chromatography, paper chromatography etc.

1. In adsorption chromatography, the stationary phase is solid. The solutes are adsorbed in different parts of the column.

2. When a column is used in such type of chromatography, the technique is known as column chromatography.

3. In partition chromatography the stationary phase may be a liquid strongly adsorbed on a solid which acts as a support.

2 Ans:- Paper chromatography is specially useful for separating milligram to gram quantities of a mixture. This is useful as a micro technique. This is based on the different in the partition coefficients of the components of a mixture between a stationary phase and a mobile phase. mobile phase is a flowing solvent immisible or partly miscible with water.

water is adsorbed by filter paper and it will be always present in the paper itself. adsorption effects is also take place to certain extent.

The solution of the mixture is applied on to the filter paper in the form of a spot. After drying the spot, the filter paper is eluated with an organic solvent in an air tight container. By keeping the mobile phase in an air tight container, an atmosphere of evenly saturated by with solvent vapour is created. After the development, the paper is dried and the separated spots and solvent front are marked with a pencil and the distance from the position of original spots are noted

The ratio of the distance of spot of a particular component to the distance travelled by the solvent front is known as Rf value for that component.

$$Rf = \frac{\text{distance travelled by component}}{\text{distant travelled by solvent front.}} \times 100$$

$$= \frac{\text{distance from origin to the centre of the spot}}{\text{distance from origin to solvent front.}}$$

Rf value depends up on the conditions like nature of paper, direction of flow of a solvent and temperature. The value of Rf are compared with the standardised values.

Q 5 Ans

According to Beer - lambert's law absorbance "A" and transmitted "T" of a solution are given by

$$A = \log \frac{I_0}{I}$$

and $$T = \frac{I}{I_0}$$

$$\therefore A = -\log T$$

$$T = 10^{-A}$$

The value of A is given by, $A = \frac{\alpha c x}{2.303}$

where 'c' is the concentration 'x' is path of length and α is the proportionality constant.