Government Degree College

Tekkali

ESTD - 1971

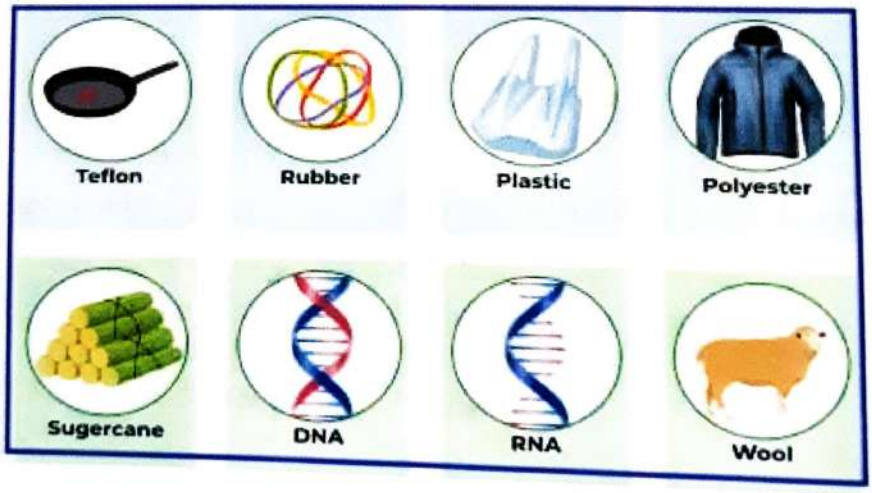
Department of Chemistry

Academic Year 2023-2024

Certificate Course

On

Polymer Chemistry



Certificate Course on

"Polymer Chemistry"

01-3-2024

Certificate course on "POLYMER CHEMISTRY" Organised by Dept. of chemistry is inaugurated by The Principal Dr. T. Govindamma in this regard Dr. B. Sateesh Kumar Vice principal & Course Coordinator has Explained the Importance and Objectives of this Course and Sri. V. Luke paul IQAC Coordinator Explained the future scope of this work and other faculty members Sri. P. V. Satyanarayana and Sri T. chandrasekhar, Sri B. Girish involved in this Programme

21 Students are enrolled for this course.

Duration of Course : 30hr Started on 01-03-2024 to 12-04-2024

Attended persons:

1) Dr T. Govindamma
Principal
GDC-TKL

PRINCIPAL
Govt. Degree College
TEKKALI-532 203

2) Dr. B. Sateesh Kumar
Vice Principal, Incharge
Course Coordinator

3) Sri. V. Luke Paul
IQAC coordinator

4) Sri. P. V. Satyanarayana
L. in chemistry

5) Sri T. chandrasekhar
L. in. chemistry

6) Sri B. Girish
L. In chemistry

Govt.Degree College Tekkali

Certificate Course on POLYMER CHEMISTRY (Course Code: CHE-PC-01)

Objectives & Outcomes

The Department of Chemistry has decided to offer a certificate course on "POLYMER CHEMISTRY" for the II, III B.SC Chemistry students to enhance their Skills which are essential for their Professional development.

Objectives:

On successful completion of this course, students will be able:

1. Have the elementary understanding of the reaction mechanisms involved in polymer synthesis and the kinetics of these reactions.

2. Learn basic concepts of polymer chain architecture, structure and morphology, with particular emphasis on the relationship between chemical structure (chain architecture) and the morphology of the solid state (semi-crystalline vs. amorphous polymers).

Course Outcomes:

In this course student will understand the polymer or macromolecules are giant molecules with large structures and high molecular weights. In spite of their varieties they are governed by the same laws that apply to Small molecules. Polymers from the basis for life itself and for our communication, transportation, buildings, food, etc. polymers include protein and nucleic acids in our bodies, the fibers (natural and synthetic) we use for clothing, the protein and starch we eat, the elastomers in our automotive tires, the paint, plastic wall and floor coverings, foam insulation, dishes, furniture, pipes, etc.

Signature of the Course Coordinator

Signature of the Department In-charge

Signature of the Principal

Govt.Degree College Tekkali

REQUESTING FOR THE APPROVAL OF CERTIFICATE COURSE

1. Department : **CHEMISTRY**

2. Title of the Certificate Course : **POLYMER CHEMISTRY**

3. Name of the Course Coordinator : **Dr B. SATEESH KUMAR**

4. Course Code : **CHE-PC-01**

5. Objectives of the Course :

On successful completion of this course, students will be able:

1. Have the elementary understanding of the reaction mechanisms involved in polymer synthesis and the kinetics of these reactions.

2. Learn basic concepts of polymer chain architecture, structure and morphology, with particular emphasis on the relationship between chemical structure (chain architecture) and the morphology of the solid state (semi-crystalline vs. amorphous polymers).

6. Outcomes of the Course :

In this course student will understand the polymer or macromolecules are giant molecules with large structures and high molecular weights. In spite of their varieties they are governed by the same laws that apply to Small molecules. Polymers from the basis for life itself and for our communication, transportation, buildings, food, etc. polymers include protein and nucleic acids in our bodies, the fibers (natural and synthetic) we use for clothing, the protein and starch we eat, the elastomers in our automotive tires, the paint, plastic wall and floor coverings, foam insulation, dishes, furniture, pipes, etc.

7. Duration of the Course : **30 Days (30hrs)**

8. Date of Commencement of the Course : **01-03-2024**

9. Course Fee : **Nil**

10. No. Of Students : **21**

Signature of the Course Coordinator

Signature of the Department In-charge

Signature of the Principal

POLYMER CHEMISTRY

Syllabus

Learning Outcomes:

Students after successful completion of the course will be able to:

1. To know the classification of polymers
2. Acquire a critical knowledge on the preparation of organic polymers.
3. To know the various applications of polymers in daily life

Unit-1: Organic Polymers **10 hours**

Basic Definitions, degree of polymerization, classification of polymers- Natural and Synthetic polymers, Organic and In organic polymers, Thermoplastic and Thermo setting polymers, Plastics, Elastomers, Fibers and Resins, Linear, Branched and Cross-Linked polymers.

Unit-2: Synthetic mechanisms of Polymers **10 hours**

Types of polymerizations -Addition polymers and Condensation polymers, Difference between Addition and condensation polymerization, mechanism of addition polymerization- Free radical, ionic and cationic and Zeigler-Natta polymerization.

Unit -3: Applications of Polymers **10 hours**

Industrial applications of following polymers- Polystyrene, Poly acrylonitrile, Poly methacrylate, Poly methyl-methacrylate, poly lactic acid, poly ethylene LDPE ,HDPE, PVC, Nylon-6, Nylon 66, Poly styrene.

References:

1) Seymour, R.B & Carraher, C.E *Polymer Chemistry*: An introduction, Marel Dekker, Inc.NewYork, 1981.

2) Odian G. *Principles of Polymerization*, 4th Ed.Wiley, 2004.

3) Billmeyer, F.w. *Textbook of polymer science*, 2nd Ed. Wiley Interscience, 1997.

4) Ghosh, P.Polymer *science & Technology*, Tata McGraw-Hill Education, 1991.34

GOVERNMENT DEGREE COLLEGE TEKKALI

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

POLYMER CHEMISTRY

STUDENTS REGISTERED 2023-24

S.NO.	NAME OF THE STUDENT	GROUP
1	ANANTHAGIRI SIDDU	III CBZ
2	BAIPALLI SRINU	III CBZ
3	BALAGA VISHNUVARDAN	III CBZ
4	BAMMIDI AKHILA	III CBZ
5	BODDANA SANDHYARANI	III CBZ
6	BODDU PADMAVATHI	III CBZ
7	BORA DHILLESWARI	III CBZ
8	GONDU REVATHI	III CBZ
9	GORLE SANDHYA RANI	III CBZ
10	JANNI PUSHPANJALI	III CBZ
11	JANNI SUNEETHA	III CBZ
12	KAMBALA THARUN KUMAR	III CBZ
13	KANURU JHANSI RANI	III CBZ
14	PANDA RASMITHA RANI	III CBZ
15	PATNAIK SHIVANARAYANA	III CBZ
16	PITTA YAMUNA	III CBZ
17	PRAGADA GANESH	III CBZ
18	NEELAPU RUKMINI	III CBZ
19	NIVEDITHA SOI	III CBZ
20	PAPPU SAHITHI	III CBZ
21	TARUN NAYAK	III CBZ

GOVERNMENT DEGREE COLLEGE TEKKALI

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

POLYMER CHEMISTRY

2023 – 2024

			1	2	3	4	5	6	7	8	9	10
S.NO.	NAME OF THE STUDENT	GROUP	01-03-2024	02-03-2024	04-03-2024	05-03-2024	06-03-2024	07-03-2024	11-03-2024	12-03-2024	13-03-2024	14-03-2024
1	ANANTHAGIRI SIDDU	III CBZ	P	P	P	P	P	P	P	P	P	P
2	BAIPALLI SRINU	III CBZ	P	P	P	P	P	P	P	A	P	P
3	BALAGA VISHNUVARDAN	III CBZ	P	P	P	P	P	P	P	P	P	P
4	BAMMIDI AKHILA	III CBZ	P	P	P	P	P	P	P	P	P	P
5	BODDANA SANDHYARANI	III CBZ	P	P	P	P	P	P	P	P	P	P
6	BODDU PADMAVATHI	III CBZ	P	A	P	P	P	P	P	P	P	P
7	BORA DHILLESWARI	III CBZ	P	P	P	P	A	P	P	P	P	P
8	GONDU REVATHI	III CBZ	P	P	P	P	P	P	P	P	P	P
9	GORLE SANDHYA RANI	III CBZ	P	P	P	P	P	P	P	P	P	P
10	JANNI PUSHPANJALI	III CBZ	P	P	P	P	P	P	P	P	P	P
11	JANNI SUNEETHA	III CBZ	P	P	P	P	P	P	P	P	P	P
12	KAMBALA THARUN KUMAR	III CBZ	P	P	P	P	P	P	A	P	P	P
13	KANURU JHANSI RANI	III CBZ	P	P	P	P	P	P	P	P	P	P
14	PANDA RASMITHA RANI	III CBZ	P	P	P	P	P	P	P	P	P	P
15	PATNAIK SHIVANARAYANA	III CBZ	P	P	P	P	P	P	P	P	P	P
16	PITTA YAMUNA	III CBZ	P	P	P	P	P	P	P	P	P	P
17	PRAGADA GANESH	III CBZ	P	P	P	P	P	P	P	P	P	P
18	NEELAPU RUKMINI	III CBZ	P	A	P	P	P	A	P	P	P	P
19	NIVEDITHA SOI	III CBZ	P	P	P	P	P	P	P	P	P	P
20	PAPPU SAHITHI	III CBZ	P	P	P	P	P	P	P	P	P	P
21	TARUN NAYAK	III CBZ	P	P	P	P	P	P	P	P	P	P

GOVERNMENT DEGREE COLLEGE TEKKALI

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

POLYMER CHEMISTRY

11	12	13	14	15	16	17	18	19	20	21	22	23
15-03-2024	16-03-2024	18-03-2024	19-03-2024	20-03-2024	21-03-2024	22-03-2024	23-03-2024	26-03-2024	27-03-2024	28-03-2024	30-03-2024	01-04-2024
P	P	A	P	P	P	P	P	P	P	P	P	P
P	P	P	P	P	P	P	P	A	P	P	P	P
P	P	P	P	P	P	P	P	P	P	P	A	P
P	P	P	P	P	P	P	P	P	P	P	P	P
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A	P	P	P	P	P	P	P	P	P	P	P	P
P	P	P	P	P	P	P	P	P	P	P	P	P
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P	P	P	P	P	P	P	P	P	P	P	P	P

GOVERNMENT DEGREE COLLEGE TEKKALI

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

POLYMER CHEMISTRY

24	25	26	27	28	29	30	No. of classes attended	Signature of the student
02-04-2024	03-04-2024	04-04-2024	06-04-2024	08-04-2024	10-04-2024	12-04-2024		
P	P	P	P	P	P	P	29	A. SIDDU.
P	P	P	P	P	P	P	28	B. SRINIS
P	P	A	P	P	P	P	28	B. Vishnu Vardhan
P	P	P	P	P	P	P	30	B. Akhila
P	P	P	P	P	P	P	30	B. Sandhya Rani
P	P	P	P	P	P	P	28	B. PADMAVATHI
P	P	P	P	P	P	P	29	B. Billiwarsuvai
P	P	P	P	P	P	P	30	G. Reavathi
P	P	A	P	P	P	P	27	G. Sandya Rani
P	P	P	P	P	P	P	29	J. pushpanjali
P	P	P	P	P	P	P	30	J. suneetha
P	P	P	A	P	P	P	28	K. Tarun Kumar
P	P	P	P	P	P	P	29	K. Jhansi rani
P	P	P	P	P	P	P	29	P. Rasmitha Rani
P	P	P	P	P	P	P	30	P. Shivanarayana
A	P	P	P	P	P	P	29	P. yamuna.
P	P	P	P	P	P	P	30	P. Ganesh
P	P	P	P	P	A	P	27	N. Rukmini
P	P	P	P	P	P	P	30	Niveditha Soi
P	P	P	P	P	P	P	30	P. Sabitri
P	P	P	P	A	P	P	29	TARUNAYAK

Head of Dept of Chemistry
Govt. Degree College
TEKKALI-532 201
Dept of Chemistry

Department of Chemistry

Polymer chemistry Certificate Course

Course Formate – Class work

Date	Name of the TOPIC	Resource person	No. of students attended	Signature of faculty
01-3-2024	Inaugation - Importance	Dr. B. Sateesh Kumar	21	B
02.03.2024	Introduction of polymers	" (Dr BSK)	19	B
04.03.2024	classification of polymers	Dr. B. Sateesh Kumar	21	B
05.03.2024	Types of polymers	Dr. B.S.K	21	B
06.03.2024	Natural polymers	Dr. B.S.K	20	B
07.03.2024	Synthetic / Semi polymers	Dr. B.S.K	20	B
11.03.2024	Organic / Inorganic polymers	Dr. B.S.K	20	B
12.03.2024	Thermosetting / Thermoplastics	Dr. B.S.K	21	B
13.03.2024	Plastics / Fibers / resins / Elastomers	Dr. B.S.K	21	B
14.03.2024	Branched / Crosslinked polymers	Dr. B.S.K	21	B
15.03.2024	Types of polymerization	Dr. B.S.K	20	B
16.03.2024	Additional polymerization	Dr. B.S.K	21	B
18.03.2024	Condensed polymerization	Dr. B.S.K	20	B
19.03.2024	Free radical polymerization	Dr. B.S.K	21	B
20.03.2024	Ionic polymerization	Dr. B.S.K	19	B
21.03.2024	Cationic polymerization	Dr. B.S.K	21	B
22.03.2024	Anionic polymerization	Dr. B.S.K	20	B
23.03.2024	Zeigler-Natta polymerization	Dr. B.S.K	21	B
26.03.2024	Applications of polymers	Dr. B.S.K	19	B
27.03.2024	Applications of PS	Dr. B.S.K	21	B
28.03.2024	Applications of PAN	Dr. B.S.K	20	B
30.03.2024	Applications of polymethacrylate	Dr. B.S.K	20	B
01.04.2024	Applications of PLA	Dr. B.S.K	21	B
02.04.2024	Applications of PE	Dr. B.S.K	20	B
03.04.2024	Applications of HDPE & LDPE	Dr. B.S.K	21	B
04.04.2024	Applications of PVC	Dr. B.S.K	19	B
06.04.2024	Applications of Nylon-6	Dr. B.S.K	20	B
08.04.2024	Applications of Nylon 6,6	Dr. B.S.K	20	B
10.04.2024	Applications of polyester	Dr. B.S.K	20	B
12.04.2024	Certificate Ceremony	"	21	B

Test No-1

Polymer chemistry

Name of the student: **Roll no:**

1. Nylon threads are made of [ ]

a. polyester polymer b. polyamide polymer c. polyethylene polymer d. polyvinyl polymer

2. Which of the following is a branched polymer? [ ]

a. low density polymer b. polyester c. high density polymer d. Nylon

3. On the basis of mode of formation polymers can be classified: [ ]

a. as addition polymers only b. as condensation polymers only

c. as copolymers d. as addition and condensation polymers

4. The process of heat softening, moulding and cooling to rigidness can be repeated for which plastics? [ ]

a. thermoplastics b. thermosetting plastics c. both (a) and (b) d. neither (a) nor (b)

5. The polymer used in making hair synthetic hair wigs is made up of [ ]

a. CH_2=CHCl b. CH_2=CHCOOCH$_3$ c. $C_6H_5CH=CH_2$ d. $CH_2=CH-CH=CH_2$

6. Which of the following monomers form biodegradable polymers? [ ]

a. 3-hydroxybutanoic acid + 3-hydroxypentanoic acid b. Glycine + Amino caproic acid

c. ethylene glycol + phthalic acid d. both a and b

7. In addition polymer, monomer used is [ ]

a. unsaturated compounds b. saturated compounds

c. bifunctional saturated compounds d. trifunctional saturated compounds

8. Polymer formation from monomer starts by [ ]

a. The condensation reaction between monomers b. The coordinate reaction between monomers

c. Conversion of monomer to monomer ions by protons d. Hydrolysis of monomers

9. Which of the following statements is not correct for fibres? [ ]

a. Fibres possess high tensile strength and high modulus b. Fibres impart crystalline nature

c. Characteristic features of fibres are due to strong intermolecular forces like hydrogen bonding

d. All are correct

10. Which of the following does not undergo additional polymerization? [ ]

a. vinyl chloride b. butadiene c. styrene d. all of the above undergoes addition polymerizations

Total Marks	
Grade	

Evolution:

Score: 90-100% – O Grade, 80-90%-A Grade, 70-80%-B Grade 60-70%-C Grade, 50-60% -D Grade

TEST No-2

Polymer Chemistry

Name of the student: **Group:**

1. A substance that is formed of multiple repeating units of _____ is known as a polymer. [ ]

a. Mers b. Plastic c. Resins d. Blocks

2. Bakelite is an example of _____polymer. [ ]

a. Elastomer b. fibre c. thermoplastic d. thermosetting

3. A polymer with an amide linkage is known as: [ ]

a. nylon-6,6 b. Teflon c. Terylene d. Bakelite

4. Which of the following is fully fluorinated polymer? [ ]

(a) Neoprene (b) PVC (c) Teflon (d) Thiokol

5. Nylon-6 is made from [ ]

(a) Butadiene (b) Chloroprene (c) Adipic acid (d) Caprolactum

6. Cellulose is a polymer of: [ ]

(a) Fructose (b) Ribose (c) Glucose (d) Sucrose

7. Cellulose acetate is a [ ]

(a) Natural polymer (b) Semi synthetic polymer (c) Synthetic polymer (d) Plasticizer

8. Ethylene-propylene rubber can be [ ]

(a) Vulcanized by sulphur (b) Vulcanized by peroxides

(c) Both (a) and (b) (d) Non-vulcanizable

9. Nylon threads are made of: [ ]

(a) Polyvinyl polymer (b) Polyester polymer (c) Polyamide polymer (d) Polyethylene polymer

10. Which of the following is an example of condensation polymers? [ ]

(a) Polythene (b) PVC (c) Orlon (d) Terylene

Total Marks	
Grade	

Evolution:

Score: 90-100% – O Grade, 80-90%-A Grade, 70-80%-B Grade, 60-70%-C Grade, 50-60% -D Grade

GOVERNMENT DEGREE COLLEGE TEKKALI

DEPARTMENT OF CHEMISTRY

CERTIFICATE COURSE

POLYMER CHEMISTRY

MARKS SHEET 2023-24

S.NO.	NAME OF THE STUDENT	GROUP	Marks Secured
1	ANANTHAGIRI SIDDU	III CBZ	17
2	BAIPALLI SRINU	III CBZ	18
3	BALAGA VISHNUVARDAN	III CBZ	18
4	BAMMIDI AKHILA	III CBZ	19
5	BODDANA SANDHYARANI	III CBZ	20
6	BODDU PADMAVATHI	III CBZ	16
7	BORA DHILLESWARI	III CBZ	15
8	GONDU REVATHI	III CBZ	16
9	GORLE SANDHYA RANI	III CBZ	17
10	JANNI PUSHPANJALI	III CBZ	18
11	JANNI SUNEETHA	III CBZ	18
12	KAMBALA THARUN KUMAR	III CBZ	17
13	KANURU JHANSI RANI	III CBZ	18
14	PANDA RASMITHA RANI	III CBZ	17
15	PATNAIK SHIVANARAYANA	III CBZ	19
16	PITTA YAMUNA	III CBZ	20
17	PRAGADA GANESH	III CBZ	19
18	NEELAPU RUKMINI	III CBZ	18
19	NIVEDITHA SOI	III CBZ	18
20	PAPPU SAHITHI	III CBZ	18
21	TARUN NAYAK	III CBZ	18

GOVERNMENT-DEGREE COLLEGE, TEKKALI

DEPARTMENT OF CHEMISTRY

STUDENT FEED BACK ON CERTIFICATE COURSE

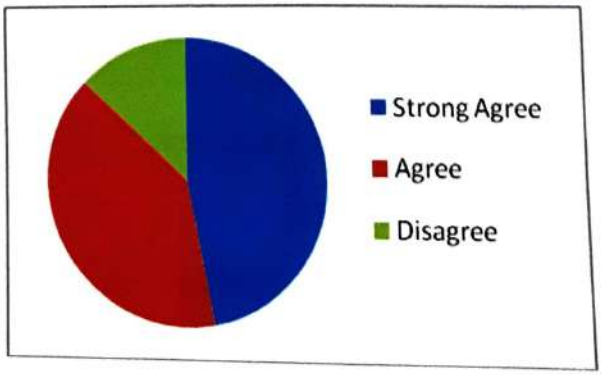
We are collecting feedback from our students personally .We have designed a special feedback on certificate course of **"Polymer Chemistry"** from the academic year **2023-24** .The analysis of student feedback on this certificate course is represented below.

ACADEMIC YEAR	GROUP	NO.OF STUDENTS
2023-2024	MPC/CBZ/BHC	21

ANALYSIS OF FEEDBACK (2023-24)

QUESTIONARIES	STRONGLY AGREE	AGREE	DISAGREE
1	18	02	-
2	10	10	-
3	7	13	--
4	9	9	02
5	5	12	03
6	10	07	03
7	06	07	07
8	07	08	05
9	14	03	03
AVERAGE	9.4	8.0	2.6
PERCENTAGE	48	39	13

THE GRAPHICAL REPRESENTATION:



(Incharge)

GOVERNMENT DEGREE COLLEGE, TEKKALI

(Accredited with NAAC 'B' Grade)

DEPARTMENT OF CHEMISTRY

Course Certificate

Certified that Mr./Ms. _____of _____Successfully completed course on "Polymer Chemistry" and scored ____ Grade during the academic year 2023-2024

Course Coordinator **IQAC Co-Ordinator** **Principal**

Certificate award Ceremony

"Polymer Chemistry"

1) Venue : Digital Lab-I
GDC-TKL

2) Cheif guest : Dr. T. Govindamma
Principal

PRINCIPAL
Govt. Degree College
TEKKALI-532 203

3) Organized by : Dept of Chemistry

4) Course coordinator : Dr. B. Satesh Kumar

5) IQAC coordinator : Sri. V. Lukepaul

6) Members present :

1) Sri. P. V. Satyanarayana
2) Sri. T. Chandrasekhar
3) Sri. B. Girish

7) Students participation - (21)

1. A. Siddu
2. B. Srinu
3. B. Vishnuvardhan
4. B. Akhila
5. B. Sandhyarani
6. B. Padmavathi
7. B. Dilleswari
8. G. Revathi
9. G. Sandhyarani

10. J. Pushpanjali
11. J. Suneetha
12. K. Tharun Kumar
13. K. Jhansirani
14. P. Sumithra rani
15. P. Shivanarayana
16. P. Yamuna
17. P. Ganesh
18. N. Rukmini
19. Niveditha Soi
20. P. Sahithi
21. Tarun Nayak