Re-Accredited 'B++' 2.86 CGPA by NAAC
VEER NARMAD SOUTH GUJARAT UNIVERSITY
University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
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# -:પરિપત્ર:-

યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ ના નવેમ્બર–૨૦૨૫ થી અમલમાં આવનાર B.Sc.Chemistry Sem.-4 નો સુધારા–વધારા કરેલ અભ્યાસક્રમ રસાયણશાસ્ત્ર વિષયની અભ્યાસ સમિતિની સભાના ઠરાવ ક્રમાંકઃ૪, ૫ અને ૬ થી મંજૂર કરી વિજ્ઞાન વિદ્યાશાખાને કરેલ ભલામણ વિજ્ઞાન વિદ્યાશાખાના અધ્યક્ષશ્રીએ વિદ્યાશાખાની મંજૂરીની અપેક્ષાએ વિદ્યાશાખાવતી ડીનશ્રીએ મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલની તા.૨૪/૧૨/૨૦૨૪ ની સભાના ઠરાવ ક્રમાંકઃ૩૫૩ અન્વયે માન.કુલપતિશ્રીને આપેલ સત્તા અંતર્ગત માનનીય કુલપતિશ્રી દ્વારા મંજૂર કરેલ છે.જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

ક્રમાંકઃઓથો./પરિપત્ર/સિલેબસ/૨૮૯૯૩/૨૦૨૫
તા.૧૨/૧૧/૨૦૨૫

કુલસચિવ વતી

પ્રતિ,
૧) યુનિવર્સિટી સંલગ્ન વિજ્ઞાન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓ.
..... આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારૂ.
૨) અધ્યક્ષશ્રી, વિજ્ઞાન વિદ્યાશાખા.
૩) પરીક્ષા નિયામકશ્રી,પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
.....તરફ જાણ તેમજ અમલ સારૂ.

# Veer Narmad South Gujarat University, Surat

## Syllabus for S.Y.B. Sc. Semester-IV

## (Effective from November- 2025) (NEP-2020)

## Chemistry Paper-III [Inorganic Chemistry]

## CH-MJ-401

**25 Marks [External]** **Total =30 Hrs.**

**25 Marks [Internal]**

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**UNIT-I**

**[A] Chemistry of Lanthanide and Actinide Elements:** **[9 Hrs.]**

Lanthanide and Actinide Elements, Electronic configuration of Lanthanide and Actinide Elements, Extraction by solvent and ion exchange, Lanthanide contraction, Use of Lanthanide compounds, Industrial use Uranium and Plutonium, Misch metal.

**[B] Hydrogen Bonding:** **[6 Hrs.]**

Theory of hydrogen bonding, Definition, classification, importance of hydrogen bonding in ice, Effect of hydrogen bonding in various fields, Differentiate sigma and H-bond, Anion solvation.

**UNIT-II**

**[A] Ion-exchange chromatography:** **[9 Hrs.]**

Synthesis and Characterization of ion exchanger, Basic requirements of ion exchange resin. Types of ion-exchange resin. Technique of ion exchange, Application of ion exchange for Separation.

**[B] Non aqueous solvents:** **[6 Hrs.]**

Introduction, classification of solvents, Properties characterizing of solvents, protonic nonaqueous solvents (liquid ammonia, anhydrous sulphuric acid), aprotic solvents (liquid $SO_2$).

**Reference Books:**


1. Introductory Quantum Chemistry by A. K. Chandra, Tata Mc. Graw Hill Delhi.
2. Atomic Structure and Chemical Bond by Manos Chandra, Tata Mc. Graw Hill Pub. Co. Ltd.
3. Theoretical Inorganic Chemistry by M. C. Day & J. Selbin Affiliated, East West Pub. Pvt. Ltd.
4. Coordination Compounds (Studies in Modern Chemistry) S. F. A. Kettle, Nelson.
5. Inorganic Chemistry by (Principles of Structure and Reactivity) James E. Huhely, Harper International (NY).
6. Inorganic Chemistry by R. B. Heslop and P. L. Robinson Elsevier Pub. Co. NY.
7. Physical Methods Inorganic Chemistry by R. S. Drago, W.B.S. Saunders Co. London, Reinhold Pub. Co. NY.
8. Basic Concepts of Analytical Chemistry by S. M. Khopkar, Wiely Estern Ltd. New Delhi.
9. Quantitative Analysis Day & Underwood Prentice Hall of India, Pvt. Ltd.
10. Instrumental Method of Analysis B. K. Sharma, Krishna Pub. House, Merrut.
11. Principles of Inorganic Chemistry (Puri, Sharma, Kalia).
12. Enviornmental Chemistry, By S. K. Banerji. Prentice Hall India Pvt. Ltd.
13. Progressive Inorganic Chemistry, Suratkar, Thatte, Pandit, Ideal Book Service, Poona.
14. Advanced Inorganic Chemistry Vol. I & II by Gurudeep Raj, Goel Pub. House, Meerut.
15. Quantum Chemistry Ir. N. Levine, Prentice Hall.
16. Advanced Inorganic Chemistry by Cotton & Wilkinson John Wihn Wiely.
17. Introduction to Chromatography Theory and Practice by V. K. Srivastava and K. K. Srivastava S. Chand Pub.
18. Environmental Chemistry by. A. K. De.
19. Industrial Chemistry by B. K. Sharma
20. Inorganic chemistry by Gray L. Miessler, Donald A. Tarr, 3rd addition, Pearson publication.
21. General and Inorganic chemistry (part-I & II) by R. Sarkar, Books and Allied (P) ltd.

# Veer Narmad South Gujarat University, Surat

## Syllabus for S.Y.B. Sc. Semester-IV

## CHP-MJ-401 : Chemistry Practicals Paper III

**25 Marks [External]** **Uni.Exam 4Hrs.**

**25 Marks [Internal]**

**[A] INORGANIC QUALITATIVE ANALYSIS: [ Minimum 08 should be done ].**

LIST OF INORGANIC CHEMICALS USED FOR INORGANIC QUALITATIVE ANALYSIS:

CHLORIDES: $Bi^{+3}$, $Cu^{+2}$, $Cd^{+2}$, $Fe^{+3}$, $Mn^{+2}$, $Co^{+2}$, $Ni^{+2}$, $Ca^{+2}$, $Ba^{+2}$, $Sr^{+2}$, $Na^{+}$, $K^{+}$, $NH_4^{+}$

BROMIDES: $Sr^{+2}$, $Na^{+}$, $K^{+}$, $NH_4^{+}$

IODIDES: $K^{+}$

NITRITES: $Na^{+}$, $K^{+}$

NITRATES: $Bi^{+3}$, $Pb^{+2}$, $Co^{+2}$, $Ni^{+2}$, $Ba^{+2}$, $Sr^{+2}$, $Na^{+}$, $K^{+}$, $NH_4^{+}$

SULPHITES: $Na^{+}$

SULPHIDE: $Zn^{+2}$, $Sb^{+3}$

SULPHATES: $Cu^{+2}$, $Cd^{+2}$, $Fe^{+2}$, $Al^{+3}$, $Mn^{+2}$, $Co^{+2}$, $Ni^{+2}$, $Zn^{+2}$, $Mg^{+2}$, $Na^{+}$, $K^{+}$, $NH_4^{+}$

CARBONATES: $Pb^{+2}$, $Bi^{+3}$, $Cu^{+2}$, $Zn^{+2}$, $Mn^{+2}$, $Co^{+2}$, $Ni^{+2}$, $Ca^{+2}$, $Ba^{+2}$, $Sr^{+2}$, $Mg^{+2}$, $Na^{+}$, $K^{+}$, $NH_4^{+}$

PHOSPHATES: , $Cu^{+2}$, $Al^{+3}$, $Fe^{+3}$, $Zn^{+2}$, $Mn^{+2}$, $Co^{+2}$, $Ni^{+2}$, $Ca^{+2}$, $Ba^{+2}$, $Sr^{+2}$, $Mg^{+2}$, $Na^{+}$, $K^{+}$, $NH_4^{+}$

(NOTE: Inorganic qualitative analysis of mixture containing four radicals. The mixture may be soluble in water or dilute hydrochloric acid or concentrated hydrochloric acid excluding Arsenite, Arsenate ,Chromates and Borate.)

**[B] ORGANIC PREPARATION: (MINIMUM 3 SHOULD BE DONE)**

1. Anthraquinone from Anthracene
2. m-Dinitrobenzene from Benzene
3. p-Bromoacetanilide fron Acetanilide
4. Naphthalene picrate from Naphthalene.

N.B. Preparation should be submitted with sample and justification (M.P. & C.T.)

# Veer Narmad South Gujarat University, Surat

## Syllabus for S.Y.B. Sc. Semester-IV

## (Effective from November- 2025) (NEP-2020)

## Chemistry Paper-IV [Organic Chemistry]

## CH-MJ-402

**25 Marks [External]** **Total =30 Hrs.**

**25 Marks [Internal]**

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**Unit-I**

**[A] NAME REACTIONS:** **[ 9 Hrs.]**

**General nature, Reaction mechanism and applications of the following reactions:**

(1) Fridle Craft reaction
(2) Aldol condensation
(3) Dickmann reaction
(4) Michael reaction
(5) Wolf-Kishner reduction
(6) Mannich Reaction
(7) Reimer Tiemann reaction
(8) Wittig reaction

**[B] Elimination reaction:** **[6 Hrs.]**

Introduction, $\beta$ -elimination, E1-mechanism, E2-mechanism, Stereo chemistry of elimination reactions, Elimination v/s substitution,

$\alpha$-elimination, Generation of carbenes and Ketenes.

**Unit-II**

**[A] Carbohydrates:** **[6 Hrs.]**

(a) General introduction:
(b) Disaccharides: Structure elucidation of maltose, lactose and sucrose
(c) Methods of methylating sugar.

**[B] Compounds containing reactive methylene group:** **[9 Hrs.]**

(d) Malonic ester: Preparation from acetic acid and its synthetic applications ( n-butyric acid, n-caproic acid, succinic acid, adipic acid, cinnamic acid and barbituric acid)

(e) Acetoacetic ester (Ethyacetoacetate): Preparation and synthetic applications (butanone, 1,3 and 1,4-diketone, alicyclic compound.)

(f) Keto-enol tautomerism: Factors affecting keto-enol tautomerism and its mechanism.

**Reference books:**


(1) Organic Chemistry by R.T.Morison and R.N. Boyd, Prentice Hall India.
(2) Organic Chemistry vol-I & II by I.L.Finar.
(3) Organic Chemistry vol-I & II by B.K.Sharma, Goel pub. House, Merrut
(4) Reaction and reagents In Organic synthesis by O.P.Agrawal Goel pub. House, Merrut.
(5) Organic Chemistry by S.H.Pine.
(6) Reaction Mechanism in Organic chemistry by S.M. Mukharji & S.P. Singh.
(7) Organic Chemistry by L.G. Wade Jr. Pretice Hall.

# Veer Narmad South Gujarat University, Surat

## Syllabus for S.Y.B. Sc.; Semester-IV

## CHP-MJ-402: Chemistry Practicals Paper IV

**25 Marks [External]** **Uni. Exam (4 Hrs.)**

**25 Marks [Internal]**

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**ORGANIC ESTIMATIONS (Minimum 4 should be performed)**

1. To determine the amount of acetamide in the given solution hydrolysis by NaOH.
2. To determine the amount of phenol in the given solution by bromination.
3. To determine Aniline in the given solution by bromination.
4. To determine the number of -COOH group of given carboxylic acid.
5. Percentage purity of l-ascorbic acid (Vitamin-c)
6. Percentage purity of Glycine.

**PHYSICAL PRACTICALS (Minimum 4 should be performed)**

1. pH metry: To determine the normality of given mix acid in $HA\bar{c}$ + HCl pH-metrically using strong base.

2 Conductometric Titration:

(i) To determine the normality of given mixture ($HA\bar{c}$ +HCl) solution by Condutometric titration with the given 0.1N NaOH solution.

3 Heat of solution;

To determine the heat of solution of organic acid ( benzoic acid, phthalic acid) by finding the solubility of the acid at two different temperature

4 Surface Tension:

To determine the parachor of –CH2 group of liquid: ( Benzene, Toluene, Xylene)

5. Adsorption:
To study the adsorption of given organic acid (Acetic acid/ oxalic acid) on animal charcoal.

6. Relative strength:

To study the relative strength of two acids $H_2SO_4$ and HCl.

7. pH metry: Determination of Ka of weak acid

To determination of ionisation constant of weak acid

# Veer Narmad South Gujarat University, Surat

## Syllabus for S.Y.B. Sc. Semester-IV

## (Effective from November- 2025) (NEP-2020)

## Chemistry Paper-V [Physical Chemistry & IKS]

## CH-MJ-403

**50 Marks [External]** **Total = 60 Hrs.**

**50 Marks [Internal]**

**UNIT-I**

**CHEMISTRY AND METALLURGY IN INDIA** **[15 Hrs.]**

[A] Early chemical techniques, technology and Arts, Different areas of development in ancient India, Glass making, Production of glass, types of glass, Archaeological evidence, Paint and Dyes. Synthesis of Blakophor B, EBT, Eosin, Alizarin and Indigo.

**[B] Iron**

History, Minerals (i)Hematite or Specular iron ore (ii) Federated or Spathic Iron ore (iii)Iron pyrite or Marcasite, Extraction, Air furnace, Reaction in the air furnace, Cast iron, Wrought iron, Chemical properties of iron, Rusting of iron.

**UNIT-II**

**NATURAL CHEMISTRY OF ANCIENT INDIAN FOOD PRESERVATION**

**[15 Hrs.]**

Introduction, general introduction about food preservation, Food preservation concept with reference to ancient Indian tradition, Food preservation with reference to chemistry, Chemical principles involved in food preservation, Ancient Indian methods of food preservation, Chemistry involved in ancient Indian food preservation methods, Modern food preservation methods, Chemistry involved in modern food preservation methods, Chemicals used in ancient Indian food preservation and modern food preservation and their role, comparison between Ancient Indian methods of preservation and Modern chemical preservation methods, along with their outcomes, advantages and disadvantages: ancient Indian food preservation, modern food preservation.

## UNIT-III

### [A] PARTITION CO-EFFICINT [6 Hrs.]

Explanation of Nenst distribution law and its conditions for the validity.

Complications arising in distribution law:

(a) Association of solute in one of the phases.
(b) Dissociation of solute in one the phases.
(c) Dissociation of solute in both the phases. Derivation of distribution law from kinetic consideration explanation of solvent extraction process.
Numerical Problems

### [B] THEMODYNAMICS [9 Hrs.]

Free energy or work function[Gibbs free energy(G) and Helmholtz free energy (A). Derivation Gibbs Hemholtz equation.

Derivation of G=G0+RTlnp. Hemholtz equation, Relation of $\Delta G$ and equilibrium constant Kp (Vant Hoff isotherm and isochore

Derivation of Clapeyron and Clapeyron-Clauius equation.

Application of Clapeyron-Clausius equation inthe derivation of Molal elevation constant & Molal depression constant. Numerical problem

## UNIT-IV

### [A] CONDUCTOMETRIC TITRATIONS: [8 Hrs.]

Principle, Types of conductometric titrations:

(a) Strong acid v/s strong base
(b) Strong acid v/s weak base
(c) Weak acid v/s strong base
(d) Weak acid v/s weak base
(e) Mixture of Strong acid and weak acid v/s strong base
(f) Precipitation titration of
(i) $BaCl_2$ v/s $K_2CrO_4$ (ii) NaCl v/s $AgNO_3$

Advantages of conductometric titrations over indicator method

### [B] IONIC EQUILIBRIA [7 Hrs.]

Relation between degree of hydrolysis, Hydrolysis constant and pH of solutions of:

(a) Salts of weak acid v/s strong base
(b) Salts of strong acid v/s weal base
(c) Salts of weak acid v/s weak base

Theories of acid-base indicators: Oswald and Quinonoid theories,

Choice of indicators, Indicator exponent and useful range of pH of an indicator.

Numerical Problems

**Reference books:**


1. Physical chemistry by Gurdeep Raj.
2. Physical chemistry by K.L.Kapoor vol.-I to IV [Pub. Macmilan]
3. Advanced Physical chemistry by D.N.Bajpai.
4. Text book of Physical chemistry by S.C. Khetepal & Yogeshwar Sharma. [Pub. R.Chand]
5. Physical chemistry by Puri & Sharma[S.Nagin & Co.]
6. A text book of Physical chemistry by A.S.Negi & Anand [New age International]
7. Physical chemistry by P.L.Soni & O.P.Dharmraj.
8. Physical chemistry by B.K.Sharma.
9. Essential of Physical chemistry by Bahl Tuli &Bahl.
10. Elemental Physical chemistry byGlasston & Lewis.
11. Physical chemistry by K.K.Sharma, L.K.Sharma [Vikas Publication House, New Delhi.]
12. Indusrtial Chemistry BY B.K.Sharma (Goysl Publication)
13. Indian Food: A Historical Companion by K. T. Achaya
14. A Historical Dictionary of Indian Food by K. T. Achaya
15. Pakadarpana of Nala (translated by Madhulika, ed. Jay Ram Yadav)
16. Techniques of Food Preservation by P. Shrivastava
17. Masala Lab: The Science of Indian Cooking by Krish Ashok
18. Brotherton, P.N and F.W. Greece. 1995. Science Process Skills: Their Nature and Interrelationship. Research in Science & Technological Education, Vol 13..5-11.
19. Chitra rata, Patil and Nupur Dasgupta. Eds. 2009. An Ancient Indian System of Rasayana Suvarnatantra: A Treatise on Alchemy, pp. 45-46, Kalpaz Publication, New Delhi.
20. Govind, V. 1970. Some aspects of Glass Manufacturing in Ancient India. National Commission for the compilation of History of Science of India, National Institute of Science of India, Vol. 5, No.2. Pp. 281-308.
21. Prakash, B. 2011. Ancient Indian Iron and steel: An Archeometallurgical study. Indian journal of history of Science,Vol.46 , No.3.pp.381-410
22. Tripathi, Vibha.2018. Metals and Metallurgy in the Harrapan civilisation, Indian journal history of Science, Vol.53, No.3.pp.279-295
23. Vaish A.K. , P.K. Biswas, N.G. Goswami, C.S.S. Krishnan and P.Ramachandra Rao.2010. Historical perspective of Iron in Ancient India, Journal of Metallurgy and Material science, Vol.42.No.1,pp.65-74
24. Chemistry of synthetic Dyes Vol 1 & 2 By Venkatraman.
25. Chemistry of synthetic Dyes By I.G. Vashi.
26. Industrial Chemistry by B.K Sharma.

# Veer Narmad South Gujarat University, Surat

## Syllabus for S.Y.B. Sc. Semester-IV

## (Effective from November-2025) (NEP-2020)

## CH - MN- 401

**25 Marks [External]** **Total =30 Hrs.**

**25 Marks [Internal]**

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**UNIT-I**

**[A] Carboxylic acid and its derivatives:** **[6Hrs.]**

Structure and nomenclature of acid chloride, ester, amides of monocarboxylic acid; Mehod of formation of monocarboxylic acid derivatives and chemical reactions.

**[B] Metal Complexes:** **[9Hrs.]**

Introduction, Werner's coordination theory, CFSE, Factors affecting on CFSE, Application of CFT (Magnetic properties, Spectral properties)

Nomenclature of complexes (Nomenclature rules, Examples of Common monodentate and multidentate ligands).

**UNIT - II**

**[A] Hydrogen Bonding:** **[6 Hrs.]**

Theory of hydrogen bonding, Definition, classification, importance of hydrogen bonding in ice, Effect of hydrogen bonding in various fields, Differentiate sigma and H-bond, Anion solvation.

**[B] Polymers :** **[9 Hrs.]**

Definition of Polymers. Types of Polymerization Reactions.

Preparation and uses of Polyethylene, Polystyrene, PVC, Polybutadiene, Nylon-6, Nylon-6,6, Novalac, Melamine-Formaldehyde.

Biodegradable Polymers: Preparation, Properties and uses of PHBV & Nylon-2-Nylon-6.

**Reference books:**


(1) Organic Chemistry vol-I & II by I.L.Finar.

(2) Organic Chemistry vol-I & II by B.K.Sharma, Goel pub. House, Merrut.

(3) Reaction and reagents In Organic synthesis by O.P.Agrawal Goel pub. House, Merrut.

(4) Organic Polymer Chemistry by K. J. Saunders.

(5) VR Gowariker, NV Viswanathan and Jayadev Sreedhar, Polymer Chemistry, New Age International Publishers (2005).

(6) Principles of Polymer Science, N.V. Sasry and P.Bahadur, Narosa Publication (2007).

# Veer Narmad South Gujarat University, Surat
## Syllabus for S.Y.B. Sc. Semester-IV
## (Effective from November-2025) (NEP-2020)
## CHP- MN- 401
## 25 Marks [External] Total =30 Hrs.
## 25 Marks [Internal] (MN-III-CHP): Chemistry Practicals

**25 Marks [External]** **Uni. Exam 4 Hrs.**

**25 Marks [Internal]**

**[A] ORGANIC SPOTTING. [ Minimum 08 should be performed ]**

ACID: Salicylic acid, Cinnamic acid, Phenyl acetic acid, Sulphanilic acid.

PHENOL: $\alpha$ -Naphthol, $\beta$ -Naphthol, o-Nitrophenol

BASE: o-Nitroaniline, m-Nitroaniline, p-Nitroaniline, p-Toludine, p-Chloroaniline, Diphenyl amine, Dimethylaniline, Diethylaniline

NEUTRAL:

ALDEHYDE: Glucose, Benzaldehyde

KETONE: Methylethylketone, Acetophenone

ESTER: Ethylacetate, Butylacetate

ALCOHOL: Ethanol, Butanol

HYDROCARBON: Anthracene, Naphthalene, Diphenyl

NITRO HYDROCARBON: m-Dinitrobenzene, Nitrobenzene

HALOGENATED HYDROCARBON: Chlorobenzene, Bromobenzene, p-Dichlorobenzene

AMIDE: Benzamide, Thiourea

ANILIDE: Acetanilide

**[B] ORGANIC ESTIMATIONS (Minimum 4 should be performed)**

1. To determine the amount of acetamide in the given solution hydrolysis by NaOH.
2. To determine the amount of phenol in the given solution by bromination.
3. To determine Aniline in the given solution by bromination.
4. To determine the number of -COOH group of given carboxylic acid.
5. Percentage purity of l-ascorbic acid (Vitamin-c)
6. Percentage purity of Glycine.

**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**
**Syllabus Effective from November-2025**
**for**
**S. Y. B.Sc Semester-IV**
**Skill Enhancement Course (SEC): Organic Preparations (Only Practical)**

# CH-SEC-401

**Total Credit: 02**
**Total Hrs.: (Practical): 30**

| Course Code | CH-SEC-401 | Title of the Course | Organic Preparation |
|---|---|---|---|
| Total credits of the course | 2 | Hours Per Week | 4hr. |

**Organic Preparation: (Minimum 08)**

1. To prepare *p*-nitroacetanilide from acetanilide.
2. To prepare Aspirin from Salicylic Acid.
3. To prepare Benzoic acid from Benzamide.
4. To prepare *m*-Nitroaniline from *m*-Dinitrobenzene.
5. To prepare 5-Nitrosalicylic acid from Salicylic acid by nitration (Green route).
6. To prepare (1,2,3,4,6-penta-)-acetyl-α-D-Glucose from α-D-Glucose.
7. To prepare Dimethylaniline oxalate from Dimethylaniline.
8. To prepare 2,4-dibromo-1-naphthol from 1-naphthol (Bromination).
9. To prepare m-Dinitrobenzene from nitrobenzene.
10. To prepare urea nitrate from urea.

**Reference Books**


1. Vogel's Practical Organic Chemistry by A. I. Vogel
2. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, V. K. Ahluwalia, R. Aggarwal
3. Practical Organic Chemistry: A Student Handbook of Techniques by J. R. Mohrig, D. F. Heathcock, and D. G. Mackean
4. Organic Chemistry Laboratory Notebook by Hayden-McNeil
5. Experimental Organic Chemistry: A Miniscale and Microscale Approach by John C. Gilbert and Stephen F. Martin
6. Advanced Practical Organic Chemistry by Dorothy M. Conlon and Kevin O. Smi.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Syllabus Effective from November-2025
for
S. Y. B. Sc.Semester-IV
Skill Enhancement Course (SEC): Synthetic Polymrs (Theory)

# CH-SEC-402

Total Credit: 01
Total Hrs.: 15 Hrs.

| Course Code | CH-SEC-402 | Title of the Course | Synthetic Polymrs (T) |
|---|---|---|---|
| Total credits of the course | 1 | Hours Per Week | 1 hr. |

## UNIT-I

## SYNTHETIC POLYMERS

[A] Synthetic Fibers with flowsheet diagram:
(1) Tetrafluoroethylene, Teflon (2) Nylon-6,10 (3) DMT, Ethylene glycol, Terylene

[B] Synthetic rubbers with flowsheet diagram:
(1) Isoprene, polyisoprene (2) Silicone rubber (3) Polyurethane rubber

[C] Plastics and Resins with flowsheet diagram.
(1) Ureas Urea formaldehyde resin, Bakelite (2) Vinylchloride, PVC (3) Vinylalcohol, Polyvinyl alcohol (4) Melamine and melamine resin (5) Bisphenol-A, Epoxy resin (6) Propylene, Polypropylene

**Reference Books**


1. Organic Polymer Chemistry by K. J. Saunders.
2. VR Gowariker, NV Viswanathan and Jayadev Sreedhar, Polymer Chemistry, New Age International Publishers (2005).
3. Principles of Polymer Science, N.V. Sasry and P.Bahadur, Narosa Publication (2007).
4. Harry R. Allcock, Frederick W. Lampe and James E. Mark, Contemporary Polymer Chemistry, 3rd edition, Pearson Prentice Hall, 2005.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
Syllabus Effective from November-2025
for
S. Y. B. Sc Semester-IV
Skill Enhancement Course (SEC): Organic Preparations (Practical)
CH-SEC-402
Total Credit: 01
Total Hrs.: (Practical): 15

| Course Code | CHP-SEC-402 | Title of the Course | Organic Preparations (P) |
|---|---|---|---|
| Total credits of the course | 1 | Hours Per Week | 2hrs. |

ORGANIC PREPARATIONS (Minimum 05)

1. To prepare *p*-nitroacetanilide from acetanilide.
2. To prepare Aspirin from Salicylic Acid.
3. To prepare Benzoic acid from Benzamide.
4. To prepare Dimethylaniline oxalate from Dimethylaniline.
5. To prepare 2,4-dibromo-1-naphthol from 1-naphthol (Bromination).
6. To prepare urea nitrate from urea.

**Reference Books**


1. Vogel's Practical Organic Chemistry by A. I. Vogel
2. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, V. K. Ahluwalia, R. Aggarwal
3. Practical Organic Chemistry: A Student Handbook of Techniques by J. R. Mohrig, D. F. Heathcock, and D. G. Mackean
4. Organic Chemistry Laboratory Notebook by Hayden-McNeil
5. Experimental Organic Chemistry: A Miniscale and Microscale Approach by John C. Gilbert and Stephen F. Martin
6. Advanced Practical Organic Chemistry by Dorothy M. Conlon and Kevin O. Smi.