

BIO-DATA

Dr.Kailash Chandra Gupta
Associate Professor
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Qualifications: M.Sc., D.Phill.

Specialization: Physical and Polymer Chemistry

Areas of Research Interest: Kinetics of homo and copolymerization, surface modifications by polymers. Applications of polymers in sensing devices, development of membrane grade polymers for reverse-osmosis technology. Responsive polymers for drug delivery and targetting. Polymers as intelligent and smart material. Design of polymer supports for catalysts and enzymes. Kinetics and mechanism of homogeneous and heterogeneous catalysis.

In-charge: Polymer Research Laboratory:

Brief biographical details and current activities:

- K.C. Gupta obtained D.Phil. degree in Chemistry from University of Allahabad in 1985 on Polymer Chemistry.
- Prior to Joining as Lecturer in 1987 at IIT-Roorkee, he worked as Scientist at IIT-Delhi and awarded number of postdoctoral fellowships on all India competition bases from Ministry of Human Resources Development, Government of India.
- He served as Assistant Professor from 1997 to 2004 and was selected for the position of Associate Professor in May 2004.
- He is involved in guiding Ph.D. and M.E. thesis and has undertaken major research projects funded by Department of Science and Technology (DST), University Grants Commission (UGC), Council of Scientific and Industrial Research (CSIR) and All India Council of Technical Education, New Delhi.
- He is having a varied research interests in exploring utilities of polymers in multiple dimensions, which include synthesis of water-soluble homo and copolymers and their applications as adsorbents, drag reducing agents for turbulent flow, as flocculent for treatment of industrial effluents.
- Kinetic and mechanistic studies of homo and copolymerization.
- Compositional and microstructural studies of copolymers and their graft copolymers.
- Surface modifications of natural and synthetic polymers and their characterization for thermal and uptake of water, dyes and metal ions.
- Estimation of Zeta-potential for frequency and distribution of grafted chains on polymer surface.
- Synthesis of membrane grade polymers for sensing devices and Reverse Osmosis Technique.

- Synthesis of tailor made piezo and pyroelectric polymers for their electronic and electrical applications.
- Polymers for controlled release and drug targeting.
- Development of thermo and electric responsive cross-linked polymer network for the release of drug and their applications as intelligent and smart material.
- Development of polymer supported catalysts and their applications in catalysis of oxidative polymerization of the phenols and alcohols.
- In addition to this he is also equally interested in innovative classroom teaching and offering courses on molecular spectroscopy, surface chemistry and polymer chemistry, which are well attended and appreciated by his students.

Acting as regular reviewer in following international journals

- Journal of Applied Polymer Sciences, John Wiley & Sons, Inc
- Journal of Macromolecular Science Pure and Applied Chemistry, Marcel Dekker, Inc. NY
- Biomaterial, Elsevier Science, Amsterdam Netherlands
- Analytica Chimica Acta, Elsevier Science, Amsterdam Netherlands
- Journal of Pharmacy and Pharmacology, Pharmaceutical Press, UK
- Indian Journal of Chemistry, New Delhi

Membership of scientific societies

- Life Member of Polymer Society of India
- Life Member of Indian Science Congress
- Life member of Indian Council of Chemists

Equipments and facilities available:

1. Vapour Pressure Osmometer, KNAUER K-700
2. UV-VIS Spectrophotometer Shimadzu-1601 PC
3. Membrane Testing Unit
4. Polymer Synthesis and Processing Units
5. Various other Testing Units for Characterization of Polymers

Current research project going on:

1. Kinetics of Graft Copolymerization of Vinyl Monomers on Cellulose, funded by UGC, New Delhi.
2. Synergistic Graft Copolymerization of Vinyl Monomers onto Cellulose, funded by Council of Industrial Research, New Delhi

Previous research projects undertaken:

1. Membrane Development for Desalination of Blackish Water, funded by DST, New Delhi
3. Polymer Modification by Graft Copolymerization, funded by UGC, New Delhi.

4. Development of Piezo and Pyroelectric Cyano Copolymers for Sensing Devices, funded by AICTE, New Delhi.
5. Undertaken various other minor projects, funded by U.P. State Government.

Representative publications:

1. K.C.Gupta, Synthesis and Characterization of Aromatic Polyamide Membranes for Desalination in Reverse – Osmosis Technique, J. Appl. Polym. Sci., 66 (1997) 643
2. K.C.Gupta, C.P.Agarwal and Padmesh Pankaj, Mathematical Model for Trans Esterification of Dimethyl Terephthalate (DMT) with Ethylene Glycol (EG) in Continuous Stirred Tank Reactor (CSIR), J. Poly. Mater, 17 (2000) 411
3. K.C.Gupta and M.N.V.Ravikumar, Drug Release Behavior of Beads and Microgranules of Chitosan, Biomaterials , 21(2000)1115
4. K.C. Gupta and Mujawamaria Jeanne D'Arc , Effect of Concentration of Ion Exchanger, Plasticizer and Molecular Weight of Cyano Copolymers on Selectivity and Sensitivity of Ion Selective Electrode , Analytica Chimica Acta, 21223 (2001) 01
5. K.C.Gupta and M.N.V. Ravikumar, pH Dependant Hydrolysis and Drug Release Behavior of Chitosan / Poly(ethylene glycol) Polymer Network Microspheres, J. Mat.Sci.Mat.Medicine, 12 (2001)753
6. K.C.Gupta and Sujata Sahoo, Graft Copolymerization of Acrylonitrile and Ethylmethacrylate Comonomers on Cellulose using Ceric Ions, Biomacromolecules (American Chemical Society), 2 (2001) 239
7. K.C.Gupta and Sujata Sahoo, Graft Copolymerization of 4-Vinyl Pyridine onto Cellulose Using Cobalt (III) Acetylacetonate Complex in Aqueous Medium, Cellulose, 8 (2001) 233
8. K.C. Gupta and Mujawamaria Jeanne D'Arc, Lead (II) Ion Selective Electrodes Based on Diphenylmethyl-N-Phenylhydroxamic Acid Ionophore in Cyanocopolymer Matrix ,IEEE Sensor Journal, 1(2001) 275
9. K.C.Gupta, Sujata Sahoo and Keerti Khandekar; Graft Copolymerization of Ethylacrylate onto Cellulose, Biomacromolecules (American Chemical Society),3,(5) (2002)1087
10. K.C.Gupta, H.K.Abdul Kadir and S.Chand; Synthesis, Characterization and Catalytic Activities of Salen Co(II) Complex Anchored on New Polymer Support, Chinese J. Journal of Polymer Science, 22 (1) (2004) 31.