

Dr. Ashesh Garai

Address:

Jogesh Polly (Math Para)

Bankura, West Bengal, India.

Pin: 722101 e-mail: agpolymer@gmail.com

Ph: +91-3242-241053

Mob: +91-9051796453



Present status: Assistant Professor in Department of Chemistry, Rammohan College, Kolkata

Present Project: Conducting Polymer Wire-Preparation and Application (UGC Minor PSW-111/15-16 ERO)

Work experience:

- **Post-Doctoral Fellow** (2012 – 2014)
University of Southampton, United Kingdom
- **Post-Doctoral Fellow** (2011 – 2012)
University of Liverpool, United Kingdom
- **Post-Doctoral Fellow** (2009 – 2011)
National Institute for Materials Science, Japan

Education:

- **Ph. D. (Polymer Chemistry)** (08/04/2009)
Jadavpur University, India **Title: Polyaniline Gel Nanocomposites**
- **Master of Science (Physical Chemistry)** 2004 1st class
Visva-Bharati University, India (Rank 3 rd.)

Professional Training (Administrative and Academic):

- Set up New Laboratory
 - Laboratory Safety
 - Chemical Disposal
 - Fire Extinguishing
 - Mentor Mentee
 - Electronically Maintain Department
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Experience in modern instrumental techniques:

1. DSC 2. DMA 3. Rheometer 4. TGA 5. Instron 6. XRD 7. Microtome [including cryo condition] 8. Hot stage with Optical Microscope 9. TEM 10. SEM 11. AFM 12. FT – IR 13. UV/ VIS 14. PL 15. DLS 16. CD 17. Rotoviscometer, Haake 18. pH/ ion / conductivity meter 19. Keithley Multimeter 20. GPC 21. GC 22. Tensiometer 23. Plasma Enhance Chemical Vapor Deposition Unit 24. Quartz Crystal Microbalance 25. Low temperature Chamber 26. Humidity Controller 27. Contact Angle Measurement 28. Fluorination Instrument 29. Micromeritics.

Research Experience: polymer synthesis including nanostructured polymer, polymer gelation, polymer crystallization, polymer-surfactant supramolecular structure formation, polymer-clay nanocomposites, polymer-CNT nanocomposites, polymer-metal particle nanocomposites, rheological properties of polymer-gel system and biomaterial (DNA/RNA). morphological, structural, thermodynamical, mechanical, rheological, conductivity and I-V analysis. Nanometer scale polymer/protein films preparation, cross-linking the films to use as membrane. Many metal-organic frameworks (MOFs) synthesis in ambient and biological condition. Protein purification, stable MOFs dispersion synthesis condition.

List of publications (h index = 13, highest impact factor of published journal = 34)

1. Montmorillonite Clay Nanocomposites of Sulfonic Acid Doped Thermoreversible Polyaniline Gel: Physical and Mechanical Properties **Ashesh Garai**, Biplab K. Kuila, and Arun K. Nandi **Macromolecules**, 2006, 39, 5410-5418.

2. Synthesis, Optical, and Electrical Characterization of Organically Soluble Silver Nanoparticles and Their Poly (3-hexylthiophene) Nanocomposites: Enhanced Luminescence Property in the Nanocomposite Thin Films Biplab K. Kuila, **Ashesh Garai**, and Arun K. Nandi **Chem. Mater.**, **2007**, 19, 5443-5452.
3. Rheology of (\pm)-Camphor-10-Sulfonic Acid Doped Polyaniline-m-Cresol Conducting Gel Nanocomposites **Ashesh Garai** and Arun K. Nandi **Journal of Polymer Science: Part B: Polymer Physics**, **2008**, 46, 28–40.
4. Morphology, Structure, Rheology, and Thermodynamics of Piezoelectric Poly (vinylidene fluoride)-Ethylene Carbonate Thermoreversible Gel D. Dasgupta, S. Manna, **A. Garai**, A. Dawn, C. Rochas, J. M. Guenet, and A. K. Nandi **Macromolecules**, **2008**, 41, 779-787.
5. Rheology of Polyaniline-Dinonylnaphthalene Disulfonic Acid (DNNSA) Montmorillonite Clay Nanocomposites in the Sol State: Shear Thinning versus Pseudo-Solid Behavior **Ashesh Garai** and Arun K. Nandi **J. Nanosci. Nanotechnol.**, **2008**, 8, 1842-1851.
6. Tuning of different polyaniline nanostructures from a coacervate gel/sol template **Ashesh Garai** and Arun K. Nandi **Synthetic Metals**, **2009**, 159, 757-60.
7. Multifunctional Hydrophilic Poly(vinylidene fluoride) Graft Copolymer with Supertoughness and Supergluing Properties Sanjoy Samanta, Dhruba P. Chatterjee, Swarup Manna, Amit Mandal, **Ashesh Garai** and Arun K. Nandi **Macromolecules**, **2009**, 42 (8), 3112-20.
8. Physical and electronic properties in multiwalled carbon nanotube-poly(3-dodecylthiophene) nanocomposites **Ashesh Garai**, Biplab K. Kuila, Subhasis Samai, Somnath Roy, Pratap Mukherjee, Arun K. Nandi **Journal of Polymer Science Part B: Polymer Physics**, **2009**, 47, 1412-1425.
9. Two-Component Thermoreversible Hydrogels of Melamine and Gallic Acid Abhijit Saha, Bappaditya Roy, **Ashesh Garai** and Arun K. Nandi **Langmuir**, **2009**, 25, 8457-8461.
10. Multiwalled carbon nanotube/polyaniline thermoreversible gel composites **Ashesh Garai**, Arun K. Nandi **Synthetic Metals**, **2009**, 159, 1710–1716.
11. Organogels from Self-assembling New Dendritic Peptides: Morphology, Rheology and Structural Investigations Goutam Palui, **Ashesh Garai**, Jayanta Nanda, Arun Kumar Nandi and Arindam Banerjee **Journal of Physical Chemistry B**, **2010**, 114 (3), 1249–1256.
12. Nanocomposites of Silver Nanoparticle and Dinonylnaphthalene Disulfonic Acid Doped Thermoreversible Polyaniline Gel **Ashesh Garai**, Shreyam Chatterjee and Arun K. Nandi **Polymer Engineering and Science**, **2010**, 50 (3), 446-454.
13. Rheological and Fluorescence Investigation of Interaction between Hexadecyltrimethylammonium Bromide and Methylcellulose in Presence of Hydrophobic Salts Aijaz Ahmad Dar, **Ashesh Garai**, Akhil Ranjan Das and Soumen Ghosh **J. phys. Chem. A**, **2010**, 114 (15), 5083–5091.
14. Viscoelastic and Conductivity Properties of Thermoreversible Polyaniline-DNNSA Gel in m-Cresol **Ashesh Garai**, Shreyam Chatterjee and Arun K. Nandi **Synthetic Metals**, **2010**, 160(15-16), 1733–1739.
15. Mechanism of polypyrrole and silver nanorod formation in lauric acid–cetyl trimethyl ammonium bromide coacervate gel template: Physical and conductivity properties Shreyam Chatterjee, **Ashesh Garai** and Arun K. Nandi **Synthetic Metals**, **2011**, 161(1-2), 62-71.
16. Optical and electronic properties of polyaniline sulfonic acid–ribonucleic acid–gold nanobiocomposites Parimal Routh, **Ashesh Garai** and Arun K. Nandi **Phys. Chem. Chem. Phys.**, **2011**, 13, 13670–13682 (Highlighted in *Nature India*).
17. Metal-organic framework growth at functional interfaces: thin films and composites for diverse applications Darren Bradshaw, **Ashesh Garai** and Jia Huo **Chemical Society Reviews**, **2012**, 41, 2344–2381.
18. MOF-polymer composite microcapsules derived from Pickering emulsions Jia Huo, Marco Marcello, **Ashesh Garai** and Darren Bradshaw **Adv. Mater.**, **2013**, 25, 2717–2722.
19. Biomineral-inspired growth of metal–organic frameworks in gelatin hydrogel matrices **Ashesh Garai**, William Shepherd, Jia Huo and Darren Bradshaw **J. Mater. Chem. B**, **2013**, 1 (30), 3678 – 3684.
20. A versatile, industrially relevant, aqueous room temperature synthesis of HKUST-1 with high space-time yield Jia Huo, Mark Brightwell, Samir El Hankari, **Ashesh Garai**, and Darren Bradshaw **J. Mater. Chem. A**, **2013**, 1 (48), 15220 - 15223.

Patent: Free Standing Polymer Membranes and Their Separation Property (Application No- 2010-004476, Patent No- 539772) **Ashesh Garai**, Sadaki Samitsu, Xinsheng Peng and Izumi Ichinose.