

Dr. Amit Mandal

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Department of Chemistry,
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□ Educational Qualification :-

✦ Doctor of Philosophy (Ph.D)

Polymer Science Unit (PSU),
Indian Association for the Cultivation of Science (IACS), Kolkata, India
Thesis title: - “[Studies on Nanostructured Polymer Blends](#)”
Advisor: - **Prof. Arun Kumar Nandi.**

✦ Master of Science (M.Sc)

Chemistry Department,
Jadavpur University, Kolkata, India,
Project titles: - “[Kinetic Studies on the oxidation of Pyruvic acid by a \$\[\text{Mn}_4\text{O}_6\]^{4+}\$ core in aqueous media](#)”
Advisor: - **Prof. Subrata Mukherjee.**

✦ Bachelor of Science (B.Sc)

Chemistry Department,
Jadavpur University, Kolkata, India,
Chemistry (**Honours**), Physics, Mathematics

□ Research Experience:-

1. ‘[Post-Doctorate Researcher](#)’ in **National Institute for Materials Science (NIMS), Japan.**

The main research responsibilities are in

- u synthesis new types of biomimetic polymer
- u The materials can be use for surface functionalization of polymer, metals and ceramics controlling the nano and hetero-interface with the structure-property relationship.
- u surfaces modification for adhesion and anticorrosion with novel mechanical, electrochemical properties.

2. ‘[Assistant Manager](#)’ of ‘**R & D**’ laboratory in **Balmer Lawrie & Co. Ltd, Kolkata** which is one of Petroleum Industry under the Ministry of Petroleum and Natural Gas, Govt. of India. The main research responsibilities are in

- ◆ Development of greases and biodegradable lubricants and analysis of their physical and chemical properties, condition monitoring and data interpretation.
- ◆ Handling of advanced analytical instruments like AAS, ICP-OES, ED-XRF, GPC, GLC, TGA/DSC, FTIR, UV-Vis spectrometer and several tribological instruments etc.
- ◆ Analysis of lube oils, polymeric additives, fatty acids and various raw materials.
- ◆ New developments of greases, lubricants polymer additives and different fatty acids.

3. **‘Post-Doctoral Research Associates’** in the Department of Polymer Science Unit in **Indian Association for the Cultivation of Science (IACS), Kolkata, India**

- Functionalization of polythiophene and its derivatives by ATRP, RAFT technique, post polymerization functionalization and their spectroscopic characterization.
- Synthesis of conducting polymer nanofibers and their self-assembled nanostructured for photovoltaic application.
- Synthesis of linear, cylindrical brushes, stimuli-responsive, pH-switchable polymers and multi-block copolymer.
- Functionalization of CNTs and Graphene and preparation of nanocomposite materials with different technological importance polymer and their material properties.

4. **‘Doctoral Research Fellow’ (Ph.D)** in the field of Polymer Chemistry from January 2008 – December 2012 in **IACS**. Experienced in synthesis of different conducting graft and block co-polymer and their characterization. Functionalization of carbon nanomaterials with polymer, ionic liquid and fabrication of nanostructured polymer blends and nanocomposite materials with enhanced properties which should be applicable in advanced technologies. My research interests are based on

- Synthesis of different conducting polymer by different approach.
- Synthesis of different nanostructured co-polymer, graft co-polymer by different polymerization technique and their characterization.
- Preparation of nanostructured blend and nanocomposite materials and their application in electronic devices.
- Functionalization of nanomaterials (carbon nanotubes, graphene, metal nanoparticles) by using polymer, ionic liquid in different methods.
- Dispersion of functional nanomaterials in industrially useful polymeric materials to produce extraordinary superior materials.
- Fabrication of polymeric smart material applications in nano-electronics, photovoltaic and energy resource using advance reinforcing fillers.

□ **Research Skills :-**

- ❖ Synthesis of different nanostructured conducting polymer.
- ❖ Synthesis of block and graft co-polymer by catalytic, ATRP, RAFT and Free radical polymerization method.
- ❖ Low temperature coupling reaction in inert atmospheric condition.
- ❖ Fabrication of polymeric blends and nanocomposite films by solvent cast and melt-blending method.

- ❖ Purification of carbon nanomaterials by oxidative treatment method.
- ❖ Functionalization of carbon nanotubes, graphene with polymer, surfactant, ionic liquid by covalent and non co-valent procedure.
- ❖ Preparation of nanocomposite films & membranes of technologically important polymer with functionalized carbon nanotubes.
- ❖ Synthesis of polymer nanofibers by self-assembly and supramolecular organization.
- ❖ Surface Modification of metal surface and polymer membrane by polymer grafting, LBL, and self-assembled monolayers.

▣ **Honours and Awards Received :-**

- ✚ **NIMS Post-doctoral research Fellowship**
Post-doctoral research Fellowship from National Institute of Materials Science, Tsukuba, Japan.
- ✚ **Best Poster Award**
In **MAM-12**, IUPAC sponsored 6th International Symposium on Macro and Supramolecular Architectures and Materials (**MAM-12**): Nano Systems and Applications. Coimbatore, India.
- ✚ **Best Poster Award**
In Chemical Research Society of India (**CRSI**), Department of Chemistry, University of North Bengal, West Bengal, India.
- ✚ **Senior Research Fellowship (SRF)**
Awarded by Council of Scientific & Industrial Research (**CSIR**), India.
- ✚ **Junior Research Fellowship (JRF)**
Awarded by **CSIR-NET/JRF** through National Eligibility Test (**NET**) for Research Fellowship & Lecturership, Conducted by Council of Scientific & Industrial Research (**CSIR**), India.

▣ **Teaching Experience :-**

Now I am working as an Assistant Professor in Behala College (University of Calcutta) from May 2015. I teach various aspects of fundamental Inorganic and Analytical Chemistry in the Undergraduate and Post graduate Theory and Practical classes with emphasis of the materials along with providing information regarding characterization by analytical instruments and their applications.

Some of the courses are listed below.

Acid-Base reactions - (UG - Courses)

Chemical periodicity (UG - Courses)

Radioactivity and Atomic Structure (UG - Courses)

Chemistry of Non- transition Elements (UG - Courses)

Redox Reaction (UG - Courses)

Electrochemical and spectral analysis, and analytical separation (UG - Courses)

Inorganic and Analytical Practical Courses (UG - section)

Electrochemical Analyses, Radiochemical Analysis (PG - Courses)

Chemical Equilibrium - I (PG - Courses)
Chemical Equilibrium - II (PG - Courses)
Inorganic and Analytical Practical Courses (PG - section), etc

▣ Complete Publications :-

1. Physical and Dielectric Properties of Poly(Vinylidene Fluoride)/ Polybenzimidazole Functionalized Graphene Nanocomposites

Nirmal Maity, [Amit Mandal](#), Kaustuv Roy, Arun K. Nandi*
(*Journal of Polymer Science Part B: Polymer Physics*–2019,57,189-201)(I.F - 2.84)(ISSN: 1099-0488)

2. Mechanically tuned Molybdenum dichalogenides (MoS₂ and MoSe₂) dispersed supramolecular hydrogel scaffolds.

Subhendu Dhibar, Amiya Dey, Debasish Ghosh, [Amit Mandal](#), Biswajit Dey*
(*Journal of Molecular Liquid* – 2019, 276, 184-193) (I.F - 4.7)(ISSN: 0167-7322)

3. A Supramolecular Cd(II)-Metalogel: An efficient semiconductive electronic device

Subhendu Dhibar, Arka Dey, Santanu Majumdar, Debasish Ghosh, [Amit Mandal](#), Partha Pratim Ray,*, Biswajit Dey*,
(*Dalton Transactions* – 2018, 47, 17412-17420) (I.F - 4.1) (ISSN: 1477-9226)

4. Enhancement of mechanical, electrical and dielectric properties in Poly(vinylidene fluoride) composites with two dimensional nanomaterials.

Nirmal Maity, [Amit Mandal](#), Arun K. Nandi*
(*J. Indian Chem. Soc.* 2018, 95, 65), (I.F – 0.5) (ISSN:0019-4522)

5. A Supramolecular gel of Oxalic Acid - Monoethanolamine for potential schottky barrier diode application

Subhendu Dhibar, Arka Dey, Santanu Majumdar, Amiya Dey, Priyanka Mukherjee, [Amit Mandal](#), Partha Pratim Ray* and Biswajit Dey*
(*Chemistry Select* – 2019, 4, 1535-1541) (I.F - 2.1)(ISSN: 2365-6549)

6. High dielectric poly(vinylidene fluoride) nanocomposite films with MoS₂ using polyaniline interlinker via interfacial interaction

Nirmal Maity, [Amit Mandal](#), Arun K. Nandi *
(*J. Mater. Chem. C*, 2017, 5, 12121- 12133), (I.F – 6.63) (ISSN: 1364 -5501)

7. Hierarchical nanostructured polyaniline functionalized graphene/ poly(vinylidene fluoride) composites for improved dielectric performances

Nirmal Maity, [Amit Mandal](#), Arun K. Nandi*
(*Polymer* 2016, 103, 83-97,) (I.F - 3.77), (ISSN: 0032-3861)

8. Synergistic interfacial effect of polymer stabilized graphene via non-covalent functionalization in poly(vinylidene fluoride) matrix yielding superior mechanical and electronic properties

Nirmal Maity, [Amit Mandal](#), Arun K. Nandi*
(*Polymer* 2016, 88, 79-83,) (I.F - 3.77), (ISSN: 0032-3861)

9. Biological activity of dendrimer-methylglyoxal complexes for improved therapeutic efficacy against malignant cells.

Srabanti Ghosh, Prabal Chakraborty, Adrita Chakrabarti, Manosij Ghosh, [Amit Mandal](#), Partha Saha, Anita Mukherjee, Somobrata Acharya and Manju Ray
(*RSC Adv.*, 2016, 6, 6631–6642) (I.F - 3.84), (ISSN: 2046 - 2069).

10. A supramolecular hydrogel for generation of a benign DNA-hydrogel

Biswajit Dey, R. K. Mondal, S. Mukherjee, B. Satpati, N. Mukherjee, [Amit Mandal](#), Dulal Senapati and S. P. Sinha Babu
(*RSC Adv.*, 2015, 5, 105961–105968), (I.F – 3.84), (ISSN: 2046-2069)

11. Interface engineering of ionic liquid integrated graphene in Poly(vinylidene fluoride) matrix yielding magnificent improvement in mechanical, electrical and dielectric properties

Nirmal Maity, [Amit Mandal](#), Arun K. Nandi*
(*Polymer* 2015, 65, 154 - 167), (I.F - 3.77), (ISSN: 0032-3861)

12. Ionic Liquid Integrated Multiwalled Carbon Nanotube in Poly(vinylidene fluoride) Matrix: Formation of Piezoelectric β -Polymorph with Significant Reinforcement and Conductivity Improvement.

[Amit Mandal](#) and Arun K. Nandi*
(*ACS Appl. Mater. Interfaces.* 2013, 5, 747-760), (I.F – 8.5), (ISSN: 1994-1852)

13. Non covalent Functionalization of Multiwalled Carbon Nanotube by a Polythiophene-Based Compatibilizer: Reinforcement and Conductivity Improvement in Poly(vinylidene fluoride) Films.

[Amit Mandal](#) and Arun K. Nandi*
(*J. Phys. Chem. C* 2012, 116, 9360-9371), (I.F - 4.81), (ISSN: 1932-7455)

14. Physical properties of Poly(vinylidene fluoride) composites with polymer functionalized Multiwalled carbon nanotubes using Nitrene Chemistry.

[Amit Mandal](#) and Arun K. Nandi*
(*J. Mater. Chem.* 2011, 21, 15752–15763) (I.F – 6.63) (ISSN: 1364 -5501)

15. Miscibility of Polythiophene-graft-poly(methyl methacrylate) brush with Poly(vinylidene fluoride): Morphology, Optical and Conductivity Properties.

[Amit Mandal](#) and Arun K. Nandi
(*Macromol. Chem. Phys.* 2011, 212, 1636-1648) (I.F - 2.62) (ISSN: 1521-3935)

16. Fabrication of Nanostructured Poly(3-thiophene methyl acetate) within Poly(vinylidene fluoride) Matrix: New Physical and Conducting Properties.

Swarup Manna, [Amit Mandal](#) and Arun K. Nandi*
(*J. Phys. Chem. B* 2010, 114, 2342-2352) (I.F - 3.61) (ISSN: 1520-5207)

17. Multifunctional Hydrophilic Poly(vinylidene fluoride) graft Copolymer with Super-toughness and with Super-gluing Properties.

Sanjoy Samanta, Dhruva P. Chatterjee, Swarup Manna, [Amit Mandal](#), Ashesh Garai and Arun K. Nandi*
(*Macromolecules* 2009, 4, 3112-3120) (I.F - 5.93) (ISSN: 1520-5835)

18. Piezoelectric β -Polymorph Stabilization by Integration of Ionic liquid Modified Multiwalled Carbon Nanotube in Poly(vinylidene fluoride)

Amit Mandal and Arun K. Nandi*

(Proceeding of the 6th IUPAC sponsored International symposium on Macro and Supramolecular Architectures and Materials (MAM-12) in Advance Nanomaterials for Industrial Applications. pp 269-276 (2012), ISBN: 978-93-82563-34-1).

19. Development of a rapid self-healing semiconducting monoethanolamine based Mg(OH)₂ –metallogel for schottky diode application with high On/Off ratio

Subhendu Dhibar, Amiya Dey, Debashish Ghosh, *Amit Mandal*, Partha Pratim Ray, Biswajit Dey*

(Accepted in New Journal of Chemistry, (I.F - 3.06) (ISSN: 1144-0546)

20. Novel high-efficiency Single-Component Polythiophene based Nanofiber with aggregation-induced White-Light Emission.

Amit Mandal and Arun K. Nandi*

(Communicated)

21. Post polymerization functionalization Pyrene-Substituted Poly(3-hexyl thiophene): Synthesis and Spectroscopic Characterization.

Amit Mandal and Arun K. Nandi*

(Communicated)

22. Spectroscopic Characterization of Multiwalled Carbon Nanotubes Bearing Surface-Immobilized Pyrene-Substituted Poly(3-hexylthiophene) via Non co-valent wrapping.

Amit Mandal and Arun K. Nandi*

(Manuscripts under preparation)

□ List of Conference presentations and lectures:-

1. Invited Lecture: *Amit Mandal*

Title:- Molecular Engineering of MoS₂ Interlayer using Polyaniline and Fabrication of Poly(vinylidene fluoride) Nanocomposite Films via Interfacial Interaction

(International Conference and Expo on “Inovation in Materials Science & Technology” at Amity University, Kolkata Organized by Indian Rubber Institute and Amity University held on 14 - 16th December 2018) (*International*)

2. Invited Lecture: *Amit Mandal*

Title:- Carbon Nanomaterials : “Jack of all trades”

(National seminar on “Recent Trends in Chemical Science” (RTCS-2018) at Department of Chemistry, Surendranath Evening College, Kolkata held on 5 - 6th October 2017) (*National*)

3. Poster Presentation: *Amit Mandal*

Title: Fabrication of Poly(vinylidene fluoride) Hierarchical Nanocomposite Films by the Integration of Functionalized Carbon Nanotube

(UGC sponsored National seminar on ‘ Recent Advances in Chemical Science and Application’ at Department of Chemistry, Vidyasagar College for Women, Kolkata held on 6 -7 January 2017) (*National*)

4. Poster Presentation: Nirmal Maity, Amit Mandal and Arun K. Nandi

Title:- Synergistic interfacial effect of polymer stabilized graphene via non-covalent functionalization in poly(vinylidene fluoride) matrix yielding superior mechanical and electronic properties

In POLYSOLVAT - 2016. Indian Association for the Cultivation of Science, Kolkata, India, on January 2016. (*International*)

5. Poster Presentation: Nirmal Maity, Amit Mandal and Arun K. Nandi

Title:- Interface molecular engineering of ionic liquid integrated graphene in PVDF matrix with improvement of mechanical, electrical and dielectric properties at low percolation threshold.

In MACRO - 2015. Indian Association for the Cultivation of Science, Kolkata, India, on January 2015. (*International*)

6. Poster Presentation: Amit Mandal and Arun K. Nandi

Title:-Fabrication of Poly(vinylidene fluoride) Nanocomposite Films by the integration of Functionalized Carbon Nanotube

In Young Scientist Colloquium (YSC) - 2013 by Materials Research Society of India (MRSI), Kolkata on August 2013. (*National*)

7. Poster Presentation: Amit Mandal and Arun K. Nandi

Title:- Enhancement of Mechanical and Conductivity Properties of Poly(vinylidene fluoride) Nanocomposite films by the Integration of Ionic Liquid Functionalized Multiwalled Carbon Nanotube.

In 3rd FAPS Polymer Congress and MACRO - 2013. Indian Institute of Science (IISc) Bangalore, India, on May 2013 (*International*)

8. Poster Presentation: Amit Mandal and Arun K. Nandi

Title:- Piezoelectric β -Polymorph Stabilization by Integration of Ionic liquid Modified Multiwalled Carbon Nanotube in Poly(vinylidene fluoride).

In MAM-12, IUPAC sponsored 6th International Symposium on Macro and Supramolecular Architectures and Materials (MAM-12): Nano Systems and Applications. Le Meridian, Coimbatore, India on November 2012. (*International*)

(*Selected Best Poster Award*)

9. Poster Presentation: Amit Mandal and Arun K. Nandi

Title:- Reinforcement of Poly(vinylidene fluoride) films with Carbon Nanotube using Non covalent wrapping of Compatibilizer.

In National Symposium In Polymer & Rubber Technology for 21st Century (PRC 2012), Centre for Research in Nanoscience & Technology, University of Calcutta, Kolkata, India on October 2012. (*National*)

10. Poster Presentation: Amit Mandal and Arun K. Nandi

Title:- Nanocomposites of Poly(vinylidene fluoride) with polymer functionalized Carbon Nanotube using Nitrene Chemistry.

In Chemical Research Society of India (CRSI), University of North Bengal, India on July 2011. (*National*)

(*Selected Best Poster Award*)

11. Poster Presentation: *Amit Mandal* and Arun K. Nandi

Title:- *Nanocomposites of Poly(vinylidene fluoride) with polymer functionalized Carbon Nanotube using Nitrene Chemistry.*

In **MACRO 2010**, 11th International Conference on Frontiers of Polymers and Advanced Materials. Indian Institute of Technology (IIT) Delhi, Delhi, India, on December 2010. (**International**)

12. Poster Presentation: *Amit Mandal* and Arun K. Nandi

Title:- *Morphology, Optical and Conductivity Properties for Miscible Blends of Polythiophene-graft-Poly(methyl methacrylate) brushes with Poly(vinylidene fluoride).*

In Colloquium on Perspectives in Polymer Science & Technology, Indian Association for the Cultivation of Science (IACS), Kolkata, India on November 2010. (**National**)

13. Poster Presentation: *Amit Mandal* and Arun K. Nandi

Title:- *Fabrication of Nanostructured Poly(3-thiophene methyl acetate) within Poly(vinylidene fluoride) Matrix.*

at Polymer Science Unit (PSU), Indian Association for the Cultivation of Science (IACS), Kolkata, India, February 2010.

14. Conference attendance:-

In International Symposium on **RSC India Roadshow**, Indian Association for the Cultivation of Science (IACS), Kolkata, India on February 2013 (**International**)

15. Conference attendance:-

In Symposium on Polymer Science (SPS-2011), Indian Institute of Science Education and Research (IISER), Kolkata, India on December 2011. (**National**)

W Orientation Course Attend : 2018, North Bengal University

W Refresher Course Attend : 2019, Banaras Hindu University

□ Professional & Academic Experiences :-

□ Act as **Head of the Department**, Department of Chemistry in Behala College in UG and PG Section from June 2017.

□ **Life Membership** of Indian Association for the Cultivation of Science (IACS), Kolkata, India

□ Supervised and trained a M.Sc summer project student performs experiment on polymer chemistry in Behala College collaboration with IACS.

Place: Kolkata

Signature: *Amit Mandal*