CURRICULUM VITAE

Dr. Rachana Kumar
Principal Scientist
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Researchgate: https://www.researchgate.net/profile/Rachana-Kumar-3

PERSONAL INFORMATION:

Date of Birth: 10thAugust, 1980

ACADEMIC RECORD

Ph.D. (2003-2008) Thesis Entitle**: "*FULLERENE CORE STARLIKE MACROMOLECULES: A NOVEL APPROACH TOWARDS THE SYNTHESIS OF ORGANO-FULLERENE NANOMATERIALS AND THEIR PROPERTY EVALUATION*"** form Department of Electronics and Smart Materials Group**, DMSRDE, Kanpur (Awarded by Kanpur University).**
Under the supervision of **Dr. T. H. Goswami**.

Research Area

Research is focused on detection of organic moieties present in different medium using calibrated HPLC, GC and spectroscopic techniques. Fatty acid compositions as per ISO guidelines in edible oils and fats. Certified reference material development i.e., BND for calibration of FTIR instrument (BND2004) and others are developed to replace the standards purchased from USA making Implementation of ISO/IEC 17025 in our lab and ISO17034 for BND. Following are key research areas-

- Synthesis of organic electronic materials for biological and device applications
- Development of energy efficient materials and technologies
- Eco-friendly and cost effective process development.
- Analytical Chemistry (estimation of fat content in edible oils and fats)

Synthesis of organic electronic materials for applications in devices and biological probes. Preparation of novel materials using cost effective and eco-friendly processes. Designed and synthesis of rynene materials (perylenediimides and naphthalenediimides) as probes for biomedical applications. Materials development for sensor applications where naphthalenediimide based probe has been developed to sense acids in effluents with selective sensitivity towards hydrochloric acid. Water soluble Fullerene materials for organic electronics and biological applications.

PROFESSIONAL RECORDS

Name of the Post	*Institute / University*	*Duration*	*Work done*
Senior Scientist	CSIR-IITR, Lucknow	24 Feb, 2022-contd.	Synthesis of organic electronic materials for biological and device applications; Development of energy efficient materials and technologies; Eco-friendly and cost effective process development; Analytical Chemistry (estimation of fat content in edible oils and fats)
Senior Scientist Scientist	CSIR-National Physical Laboratory (NPL), New Delhi, India	Oct 2016-Feb 2022 Oct 2012-Oct'2016	Testing of analytes, Metrology, BND development, Quality system management, development of energy efficient materials and technologies
Research Scientist II	Georgia Institute of Technology, USA **(Shell Sponsored Project)**	1st March 2018-Feb 2019	Preparation of Polymer fiber and Carbon Molecular Sieve Membranes for Flue gas **CO_2/N_2 separation**
Post Doctoral Fellow	Georgia Institute of Technology, USA **(Boeing Sponsored Project)**	1st Oct. 2010-June 2012	Preparation of Polymer fiber and Carbon Molecular Sieve Membranes for **O_2/N_2 separation** in air
Post Doctoral Fellow	Clemson University, USA	1st June 2009-May 2010	1. Formation of large pore Metal organic framework (MOF) in bulk and also over SAM modified substrate. 2. Graphene Synthesis from poly aromatic hydrocarbons
Staff Scientist	Technical University Dresden, Germany	May 2008-Dec 2008	Synthesis of Carbazole based Anti-tuberculosis drug
Research Associate	Indian Institute of Technology Kanpur, India	April 2007 to March 2008	Synthesis and characterization of Conducting polymers for LED and PVs, small molecules for LEDs
Project Fellow	**CSIR-National Botanical Research Institute**, Lucknow	2002-2003	Estimation of pesticides in vegetable oils

TECHNOLOGY TRANSFERRED

1. **"Preparation of standard polystyrene films for applications in calibration of FTIR instrument"** Technology transferred to M/s Sirim Scientific Solutions, Hyderabad, Telangana,6th Oct, 2020.
2. **"Process for Synthesis of Fullerene Acceptor for Organic Solar Cells [6,6]-phenyl-C61-butyric acid methyl ester (PC61BM)"**M/s Nmo Lab Pvt. Ltd. New Delhi, 31st Jan 2022.

SPONSORED PROJECTS

Industry Sponsored Project:

1) Potability test of water for graphite reinforced plastic pipes as per IS12709:1994, Clause 16. PI, 2022 of Rs. **10 Lakhs (Ongoing)**

DST Sponsored Project: **2) New Fullerene based covalent Donor-acceptor dyads for enhanced solar energy conversion** (Young Scientists start-up grant), PI, 2014 of Rs. **27.5lakhs (completed)**

3) "Development of New Interfacial Layers for Efficient and Stable Excitonic Solar Cells" Solar Energy research initiative (SERI) 2017, 1 crore (completed)

4) "Semiconducting Thiophene Based Electronic Materials for Organic Solar Cells" Co-PI, SERB-DST, 2015, 45 Lakhs (completed)

5) "Bulk preparation of p-type and n-type materials for excitonic solar cells" PI, SERD special call from SERB-DST Jan 2021 of Rs. **58 lakhs (On-going)**

Ph.D. Thesis Supervised as AcSIR Assistant Professor

1. Title of PhD thesis: ***Development of Fullerene based Dyad Materials for Organic Photovoltaic Applications***, Ms. Neha Gupta, **Awarded** on 31 Oct 2018.

2. Title of PhD thesis: ***Novel Approach towards the Synthesis of Acceptor Materials for Organic Photovoltaic Applications***, Ms. Samya Naqvi. **Awarded** on 18th Dec 2018.

3. Title of PhD thesis: ***Synthesis and property evaluation of novel organic small molecule based electron acceptors for organic photovoltaic applications***, Ms. Neelam Kumari, **Awarded** on 7th March 2019.

4. Title of PhD thesis: ***Synthesis and characterization of poly(3,4-ethylenedioxythiophene) and its derivatives for organic electronics applications,*** Ms. Sonal Gupta, **Awarded** on 15th May 2020.

5. Title of PhD thesis: ***"Design and synthesis of novel naphthalenediimide derivatives for opto-electronic applications"***, Ms. Mehak Ahuja, Submitted on 6th Jan, 2023

6. Title of PhD thesis: ***"An approach towards synthesis of substituted perylenediimides for applications in organic electronics"***, Ms. Komal Bharadwaj, Submitted Feb, 2023.

7. Title of PhD thesis: ***Rylene materials for biological applications***, Ms. Rashmi Gautam, registered in Fall 2022.

Patents: Three granted, 2 US patents and 1 Indian Patent, 1 filed
Total Publications: > 49 with average IF ~4.2

M.Tech./M.Sc. Thesis Supervised:~14

Course teaching to Ph.D. scholars:
Advanced course on polymer and their applications (AcSIR)
Basic and applied chemistry (AcSIR)

Journal Reviewer

Carbon, Elsevier Impact factor of 6.2
RSC Advances by RSC with Impact factor of 3.7
New J Chem. by RSC with Impact factor of 3.3
Journal of Molecular Structure Elsevier 1.75
J Phys. Org Chem by Wiley Impact factor of 2
DST-SERB project proposals

Administrative responsibilities

Doctoral advisory committee member of >15 Ph.D. students
Selection committee member of AcSIR Ph.D. students under chemical sciences (Dean's nominee)
Signatory of certificate issued for BND2004
Organizing committee member of Annual Open Day
Organizing committee member of Annual Foundation Day
Member of various technical purchase committees
Selection committee member of Abdul Kalam Summer fellowship

Academic courses taken:
Structure and bonding, common organic reactions and mechanism, separation and purification methods, Elementary principles and applications of electronic, vibrational, NMR, EPR and Mass Spectral techniques to simple structural problems, spectroscopy, reaction kinetics, macromolecules, nuclear chemistry, chemistry of transition and non-transition elements, topics in analytical chemistry, stereochemistry and conformational analysis, heterocyclic chemistry, reagents in organic synthesis, photochemistry, nanotechnology, polymer synthesis and characterization

AWARDS AND FELLOWSHIPS

- **Young Scientist Start-up Grant** by SERB-DST, 2014
- 30th April, 2007 as **Project Scientist** at IIT-Kanpur (Electrical Engg. Dept.)
- 2008, Awarded for **Senior Research Fellow** from CSIR.
- 9th May 2006 to 29th April 2007 awarded with **Senior Research Fellowship** from DRDO at DMSRDE, Kanpur.

 9th May-2003 to 8th May 2006 awarded with **Junior Research Fellowship** from DRDO at DMSRDE, Kanpur.
 Sept 2002 – April 2003: **Project Assistant** awarded under the CSIR sponsored project at NBRI, Lucknow.
 NET, 2002 from CSIR.
 6thposition in Girl's and 19thposition in general **merit list** in High School (U. P. Board).
 Best poster award by **University of Lucknow** in National Workshop on Nanomaterials and Nanotechnology, March 24-25, 2007.

OTHER ACTIVITIES:

1. Organizer of several conferences and anchored the inaugural functions.
2. Participated in "Induction Training Program" organized by HRDG CSIR, July 2013.
3. IPR training organized by HRDG Ghaziabad.

Professional memberships:

 Life member of National Magnetic Resonance Society of India.
 Life member of IAPT.

LIST OF PUBLICATIONS

Patents:

1. **Carbon Molecular Sieve Membrane (CMSM) Performance Tuning By Dual Temperature Secondary Oxygen Doping (DTSOD)**
   Inventors: **Rachana Kumar**, William J Koros
   US Patent App. 13/906,143, 2013
2. **Title: Cost effective and Eco-friendly Process for the synthesis of [6,6]-phenyl-C61-butyric acid pentyl ester (PC61BP) under aerobic conditions**
   Inventors: **Rachana Kumar**, Samya Naqvi, Neha Gupta, Suresh Chand
   US Patent US20160237018 A1
   Application number US 15/047,342
   Publication date Aug 18, 2016
   Filing date Feb 18, 2016
3. **Title: A process for electrochemical deposition of PEDOT as HTL useful in organic solar cells**
   Inventors: Asit Patra, **Rachana Kumar**, V. Agrawal, R. Bhargav, Shahjad, D. Bhardwaj, R. K. Singh, S. Chand
   Patent Application No. 201611027796
   Application filing date : 23/02/2016
   Publication date : 23/02/2018
4. **Title: Ionic-asymmetric aliphatic diamine terminated rylene dicarboximide organic electronic materials**
   Inventors: **Rachana Kumar**, Samya Naqvi, Mehak Ahuja, Komal Bhardwaj, Rajiv Kumar Singh, Asit Patra, Sushil Kumar
   Status: Patent submitted to Indian patent office (Appl. No. 202211050720; 0137NF2022 Date of filing 02/09/2022)

Book:

1. Chapter: "**Advanced Materials for Strategic and Societal Applications**", Metrology for Inclusive Growth of India, Springer Nature, 2020. ISBN 978-981-15-8872-3

2. Chapter: **Rachana Kumar** & Neelam Kumari entitled "**Novel fluorene based n-type semiconductor materials for organic electronic applications**" ISBN 978-620-0-78765-1 Lambert Academic Publishing, 2020.
3. **Book** by **Rachana Kumar** and Pramod Kumar entitled "Preparation of Graphene Oxide from Tattered Graphite and Applications" ISBN 978-3- 330-00286-9 LAP LAMBERT Academic Publishing GmbH & Co., Germany, 2016.
4. **Chapter:** T. H. Goswami, **Rachana Kumar** in "Fullerene Research Advances", ed. Carl N. Kramer, NOVA Science Publishers, NY, 2007, Ch. 3 pages 55-96; entitled "**Recent Development of Fullerenol Research**" (ISBN: 1-60021-824-5).

SCI Journals

1. Perylene dimide incorporated activated carbon as a composite electrode for asymmetric supercapacitor.
   Prashant Dubey, Komal Bhardwaj, **Rachana Kumar**, Shashank Sundriya, Priyanka H. Maheshwari, **Journal of Energy Storage, 2022, 56, Part B, 106058. (IF: 8.9)**
2. Perylenediimide derivatives with branched imide substituents: aggregation behaviour and impact on photovoltaic properties
   Komal Bhardwaj, Samya Naqvi and Rachana Kumar*
   Solar Energy, 2022, 246, 320-330. (IF: 7.2)
3. Tuning of energy levels, transport properties and device performance of naphthalenediimide derivatives by introduction of Michael addition reaction
   Mehak Ahuja, Saurabh Kumar Saini, Neeraj Chaudhary, Mahesh Kumar, Rajiv K. Singh and **Rachana Kumar***
   New J. Chem., 2022, 46, 15392 – 15404. https://doi.org/10.1039/D2NJ01979E (IF 3.9)
4. Efficiency measurement of organic solar cells : Step by step protocol to be followed
   Mehak Ahuja,–Samya Naqvi, Amit Kumar, **Rachana Kumar**,* Rajiv K. Singh, Sushil Kumar **MAPAN**, **2022, 37, 311-318. https://doi.org/10.1007/s12647-021-00522-5 (IF 1.5)**
5. Lab on a strip chemical sensor: Reversible visual absorption sensor for detection of acids using naphthalenediimide derivative
   Mehak Ahuja and **Rachana Kumar***
   IEEE Sensors, **2022, 22, 12530 – 12538. https://doi.org/10.1109/JSEN.2022.3175503 (IF: 4.3)**
6. Influence of fluoride anion on photoinduced charge transfer interactions in adenine-functionalized push-pull naphthalene diimide chromophores
   Shailesh S. Birajdar, Mehak Ahuja, Avinash L. Puyad, Mahesh Kumar, Vishal G. More, **Rachana Kumar**,* Sidhanath V. Bhosale* and Sheshanath V. Bhosale*
   Mater. Adv., 2022, 3, 4659-4666. https://doi.org/10.1039/D2MA00030J
7. Charge transfer induced symmetry breaking in GaN/Bi2Se3 topological heterostructure device
   F. Ahmed, **R. Kumar,*** S. S. Kushvaha, M. Kumar, P. Kumar*
   NPJ 2D Materials and Applications, **(IF 11.4)** 6, 12 (2022). https://doi.org/10.1038/s41699-022-00288-72021.
8. An efficient electron transport properties of fullerene functionalized with tricyanovinyldihydrofuran (TCF)
   S. S. Birajdara, K. Bhardwaj, **Rachana Kumar*,** M. Kobaisi, S. V. Bhosale,* S. V. Bhosale*
   Materials Research Bulletin, 2022, 147, 111644 **(IF 5.6)** 10.1016/j.materresbull.2021.111644
9. Saturated and unsaturated aliphatic side chain-appended naphthalenediimide derivatives: synthesis and structure property relationship.
   Mehak Ahuja, Neelam Kumari, Samya Naqvi and **Rachana Kumar***
   J. Mater. Sci., 56, 18327–18340 (2021). https://doi.org/10.1007/s10853-021-06502-z **(IF 4.6)**
10. Solid-state synthesis of conjugated doped poly(3,4-ethylenedioxythiophene): An effective adsorbent for selective anionic dye removal.
    Sonal Gupta, Anamika Mishra, **Rachana Kumar**, Asit Patra

Reactive and Functional Polymers, 2021, 165, 104972. (IF 4.9)

11. Comparative study of aliphatic vs. aromatic substituted perylenediimide as electron transport layer material
    Komal Bhardwaj, Samya Naqvi and Rachana Kumar*
    Solar Energy, 2021, 220, 608-616. (IF: 7.2)
12. Influences of the number of 2-ethylhexylamine chain substituents on electron transport characteristics of core-substituted naphthalene diimide analogues.
    S. S. Birajdar, S. Naqvi, K. S. More, A. L. Puyad, **Rachana Kumar**,* S. V. Bhosale.* S. V. Bhosale*
    New J. Chem., 2021, 45, 1590-1600. (IF 3.9)
13. Facile h-MoO3 synthesis for NH3 gas sensing application at moderate operating temperature
    S. Kumar, A. Singh, R. Singh, S. Singh, P. Kumar, **Rachana Kumar***
    Sensors and Actuators B Chemical, 2020, 325, 128974. (IF : 9.2)
14. Flexible perylenediimide(PDI)/GaN organic-inorganic hybrid system with exciting optical andinterfacial properties
    Rachana Kumar* et. al.,
    Scientific Reports, 2020, 10, 10480. (IF : 5)
15. Synthesis of graphene oxide with a lower band gap and study of charge transfer interactions with perylenediimide**. Rachana Kumar*** et. al.,
    New J. Chem., 2020, 44, 12704-12714. (IF 3.9)
16. Facile synthesis of naphthalene diimide (NDI) derivatives: Aggregation induced emission, photophysical and transport properties
    Neelam Kumari, Samya Naqvi and **Rachana Kumar***
    J. Mater. Sci. Mater. Electro. 2020, 31, 4310-4322. (IF :2.8)
17. Synthesis and comparative charge transfer studies in porphyrin–fullerene dyads: Substituents effect
    Neha Gupta, Nikita Vasishtha, Mahesh kumar and **Rachana Kumar***
    J. Nano Sci. Nanotech., 2020, 20, 3437-3447 (IF : 1.3)
18. Electron Transport and Ultrafast Spectroscopic Studies of New Methanofullerenes bearing Heteroatom
    Samya Naqvi, Nikita Vasishtha, Mahesh kumar and **Rachana Kumar***
    New J. Chem., 2019, 43, 15626-15635 (IF 3.9)
19. Facile synthesis and evaluation of electron transport and photophysical properties of photoluminescent PDI derivatives
    Samya Naqvi, Mahesh Kumar and **Rachana Kumar***
    ACS Omega, 2019, 4, 19735-19745. (IF : 4.1)
20. Highly permeable carbon molecular sieve membranes for efficient CO2/N2 separation at ambient and subambient temperatures
    Rachana Kumar, Chen Zhang, Arun K. Itta and Willam J. Koros
    J. Membr. Sci., 2019, 583, 9-15, doi.org/10.1016/j.memsci.2019.04.033 (IF 10.5)
21. High performance carbon molecular sieve membranes resistance to aggressive feed stream contaminants.
    Rachana Kumar and William J. Koros
    Ind. Eng. Chem. Res., 2019, 58, 6740−6746 (IF: 4.3)
22. Carbon molecular sieve membranes for CO2/N2 separations: Evaluating subambient temperature performance
    M. Joglekar, A. K. Itta, **R. Kumar**, G. B. Wenz, J. Mayne, P. J. Williams, W. J. Koros
    J. Membr. Sci. 2019, 569, 1-6. (IF 10.5)
23. Ultra-Thin Skin Carbon Hollow Fiber Membranes for Sustainable Molecular Separations
    C. Zhang, **R. Kumar**, W. J. Koros
    AIChE J., 2019, 65, e16611 doi.org/10.1002/aic.16611 (IF : 4.2)
24. Highly productive carbon molecular sieve membranes for post- combustion CO2 capture: Substrate resistance mitigation
    Rachana Kumar, Arun K. Itta. Chen Zhang, and Willam J. Koros
    Chem. Engg. Sci. (Submitted) 2021
25. Synthesis and comparative charge transfer studies in porphyrin-fullerene dyads: Mode of attachment effect
    Neha Gupta, Chhavi Sharma, Mahesh kumar and **Rachana Kumar***
    New J. Chem., 2017, 41, 13276-13286, 10.1039/C7NJ01613A (IF ; 3.9)
26. Naphthalene diimideself assembled ribbons with high electrical conductivity and mobility without doping NeelamKumari, SamyaNaqvi and **Rachana Kumar***
    J. Mater Sci, 2017, 53, 4046-4055. (IF l; 4.8)
27. Synthesis and Charge Transport Properties of New Methanofullerenes
    SamyaNaqvi,‡Neha Gupta,‡NeelamKumari, JyotiGarg and **Rachana Kumar***
    New J. Chem., 2017,41, 1933-1939; DOI 10.1039/C6NJ03445D (IF ; 3.9)
28. Comparative charge transfer studies in non-metallated and metallated porphyrin fullerene dyads
    Neha Gupta, SamyaNaqvi, MukeshJewariya, Suresh Chand and **Rachana Kumar***

J. Phys. Org. Chem. 2017, 30, e3685 **10.1002/poc.3685 (IF: 2.4)**

29. Fullerene grafted graphene oxide with effective charge transfer interactions
Rachana Kumar,* Saba Khan, Neha Gupta, SamyaNaqvi, Kumar Gaurav, Chhavi Sharma, Mahesh Kumar, Pramod Kumar, Suresh Chand
Carbon, 2016, 107, 765-773; Impact Factor : 11.3

30. Synthesis and ultrafast spectroscopic study of new [6,6] methanofullerenes.
SamyaNaqvi, Neha Gupta, NeelamKumari, MukeshJewariya, Pramod Kumar, **Rachana Kumar*** and Suresh Chand
RSC Adv., 2016, 6, 24889-244897; Impact Factor :4.0

31. Bulk synthesis of highly conducting graphene oxide with long range ordering
Rachana Kumar,* SamyaNaqvi, Neha Gupta, Kumar Gaurav, Saba Khan, Pramod Kumar, AniketRana, Rajiv K. Singh,RamilBharadwaj, and Suresh Chand
RSC Adv., 2015, 5, 35893-35898; Impact Factor :4

32. A cost effective and eco-friendly one-pot process for PC61BM synthesis under aerobic conditions
Rachana Kumar,*Samya Naqvi, Neha Gupta and Suresh Chand
RSC Adv.,2014,4, 15675-15677; Impact Factor :4

33. Stable graphite exfoliation by fullerenol intercalation via aqueous route
Rachana Kumar,*Pramod Kumar, Samya Naqvi, Neha Gupta, Niharika Saxena, Jitendra Gaur, Jitendra K. Maurya and Suresh Chand
New J. Chem., 2014, 38, 4922-4930; Impact Factor :3.9

34. Selenium-Containing π-Conjugated Polymers for Organic Solar Cells
AsitPatra, **Rachana Kumar** and Suresh Chand
Israel J. Chem., 2014, 54, 621-641; Impact Factor : 3.3

35. Magnetocaloric effect and refrigeration cooling power in amorphous Gd7Ru3 alloys
Pramod Kumar and **Rachana Kumar**
AIP Advances, 2015, 5, 077125(1-8) (IF :1.5)

36. Pressure dependent magnetic, AC susceptibility and electrical properties of Nd7Pd3
Pramod Kumar, Puneet Jain and **Rachana Kumar**
RSC Advances, 2015, 5, 58928-58935. Impact Factor :4

37. Crystal structure and negative magnetization in Sm2Al and Sm1.988Gd0.012Al compounds
A.K. Nigam Pramod Kumara, **Rachana Kumar**, S. Pandeya, K.G
Physica B: Condensed Matter, 2014, 448, 6-8. Impact Factor : 2.4

38. Carbon molecular sieve membrane performance tuning by dual temperature secondary oxygen doping (DTSOD)
Rachana Singh, William J. Koros
Journal of Membrane Science, 2013, 427, 472-478. (IF 10.5)

39. Electrochemical, Photophysical, and Magnetic Properties of Green Emitting Bis(2,5-Hexyloxy)-Phenylene-alt-Thiophene Fluorescent Conducting Oligomer Addended Fullerene-diol Dyad
Rachana Singh, ThakohariGoswami
International Journal of Organic Chemistry, 2013, 3, 49-64.

40. Photophysical and optical limiting properties of multifunctional hemi-ortho ester derivatives of fullerenol: effects of TBAH doping, fullerenol concentration and solvent polarity
Rachana Singh, Thako Hari Goswami
Synthetic Metals 2011, 161(9-10), 670-679 (IF: 3.3)

41. Understanding of thermo-gravimetric analysis to calculate number of addends in multifunctional hemi-ortho ester derivatives of fullerenol
Rachana Singh, ThakoHariGoswami
Thermochimica Acta 2011, 513(1-2), 60-67 (IF: 3.1)

42. Effect of nature of addends and Ionic dopant on magnetic properties of multifunctional star-like hemi-ortho ester derivatives of fullerenol
Rachana Singh, Thako Hari Goswami
Synthetic Metals 2011, 161 (19-20), 2070-2077. (IF: 3.3)

43. Recent development of fullerenol research
Rachana Singh, ThakoHariGoswami
Advances in Condensed Matter and Materials Research 2010, 7, 341-380.

44. Acid Catalyzed 1, 2 Michael Addition Reaction: A Viable Synthetic Route in Designing Fullerene Core Starlike Macromolecule
Rachana Singh, ThakoHariGoswami
J. Phys. Org. Chem. 2008, 21 (3), 225-236 (IF : 2.4)

45. Synthesis And Evaluation of Thermal, Photophysical& Magnetic Properties of Novel Starlike Fullerene-Organosilane Macromolecules
Rachana Singh, Thako Hari Goswami
J. Organomet. Chem. 2008, 693, 2021-2032. (IF: 2.3)

46. Highly Luminescent Multifunctional Hemi-ortho Ester Derivatives of Fullerenol

Rachana Singh, ThakoHariGoswami
Synthetic Metals 2007, 157 (22-23), 951-955 (IF: 3.3)

47. One Pot Synthesis of a Novel Water Soluble Fullerene Core Star-Like Macromolecule via Successive Michael and Nucleophilic Addition Reaction
ThakoHariGoswami, Rachana Singh, SarfarazAlam, Gyanesh N. Mathur
Chemistry of Materials 2004, 16(12), 2442-2448 (IF: 10.5)

48. Thermal Analysis: A Unique Method to Estimate the Number of Substituents in Fullerene Derivatives
ThakoHariGoswami, Rachana Singh, SarfarazAlam, Gyanesh N. Mathur
ThermochimicaActa2004, 419, 97-104 (IF: 3.1)

CONFERENCE PAPERS

1. "Michael Addition Reactions In Fullerene"
Oral presentation in **"National Seminar on Fullerene, Calixarine and Crown Ether"** at Gujarat University during February 27-28, **2004**
ThakoHari Goswami*, **Rachana Singh**, Sarfaraz Alam, G. N. Mathur

2. "FTNMR Study of Water Soluble Fullerene Derivatives" International Conference on "**Magnetic Resonance in Biological Systems"** (21st ICMRBS) January 16-21, 2005, Hyderabad.
Rachana Singh, Sanjay Kanojia, Ajit Srivastava, T. H. Goswami, D. N. Tripathi

3. "Nonconventional Fullerene Core Starlike Dyad Materials"
International Conference on **"Nano-Materials for Electronics"** Nov 27-29, 2006, C-MET, Pune.
Rachana Singh, T. H. Goswami

4. "Iron Coated Fullerenol Materials: Excellent Ferromagnetic Compound"
National Conference on **"Smart Materials & Recent Technologies"** Feb 22-23, 2007, Tirupati.
Rachana Singh, T. H. Goswami

5.Synthesis and Characterization of Fullerene Based Photovoltaic Materials
National Workshop on Nanomaterials and Nanotechnology, March 24-25, 2007; Lucknow University, Lucknow.
Rachana Singh, T. H. Goswami, D. K. Setua, K. U. Bhasker Rao, R. S. Anand
Awarded for Best Poster

6. Novel Starlike Fullerene-Organosilane Dyad Macromolecules
National Conference on the Emerging Trends in the Photovoltaic Energy Generation and Utilization, 27-29 March, 2008
Indian Institute of Technology Kanpur
Rachana Singh, T. H. Goswami, D. K. Setua, K. U. Bhasker Rao, R. S. Anand

7. TAPSUN conference 2012 at NPL, New Delhi

8. Facile Synthesis of Graphene Oxide from Tattered Graphite for Device Applications
Samya Naqvi, Gaurav Kumar, Saba Khan, Neha Gupta, Niharika Saxena, Neeraj Chaudhari, Pramod Kumar, **Rachana Kumar*** and Suresh Chand
MACRO 2015
Awarded by ACS for Best Poster*

9. Advanced Alternate HTL Materials for Organic Photovoltaics
Invited Talk* at "First International Conference on Advanced Materials for Power Engineering" (ICAMPE-2015) 11-13 December 2015 at Mahatma Gandhi University, Kottayam, Kerala, India.

10. Synthesis and Electron Transport Studies of Perylenediimide based acceptors for Organic Photovoltaic Applications; IC3N-IIT
Samya Naqvi, Rachana Kumar and Suresh Chand

11. Charge Transport Studies of Perylenediimide based acceptors for Organic Photovoltaic Applications
Samya Naqvi, **Rachana Kumar** and Suresh Chand, ICTF-2017

12. Development of Fullerene based new Acceptor Materials Under Aerobic Conditions for Organic Photovoltaic Applications,IWPSD-Bangalore
Samya Naqvi, Neelam Kumari, **Rachana Kumar***, G.D Sharma, RamilBharadwaj and Suresh Chand
13 Facile Synthesis of Graphene Oxide (*m*-GO) from Tattered Graphite for Device Applications
Samya Naqvi, Kumar Gaurav, Saba Khan, Neha Gupta, NiharikaSaxena, NeerajChaudhary, Pramod Kumar, **Rachana Kumar** and Suresh Chand,Macro-2015
14. Amine assisted methanofullerene synthesis, ICMTECH-2016
Samya Naqvi, Neha Gupta, **Rachana Kumar** and Suresh Chand
15. Stable Device Fabrication for Accurate measurement of Power Conversion Efficiency
Mehak Ahuja and **Rachana Kumar**
International conference on Advanced Materials and Nanotechnology at Jaypee Institute, Noida –, February 2020
16. E-Workshop on "Spectroscopic Techniques: Basics and applications" December 2020, CSIR, NPL.
17. Invited Lecture: "Advanced Materials and Instrumentation Based Engineering" (AMIBE April, 2021), IIIT Allahabad.
18. Optimization of Parameters for Synthesis of Graphene Oxide with Long Range Order.
Komal Bhardwaj, Naveen Joy Kindo, **Rachana Kumar** at JIIT, Noida , AMN-2020
19. Invited lecture on "Basics and metrology of excitonic solar cells" NIT Uttarakhand, 2020.

20. Bulky end group appended Naphthalene diimide (NDI) derivatives: Influence on optical and transport properties. Oral presentation
Mehak Ahuja and Rachana Kumar
International Online Conference on Materials Science and Technology, ICMT, 2021, 12-14 November, 2021, Mahatma Gandhi University, Kottayam, Kerala, India
Third prize for best presentation
21. Naphthalenediimide derivative based paper strip chemical sensor for the visual detection of acids. Oral presentation
Mehak Ahuja and Rachana Kumar
Frontiers In Materials for Technological Applications, FIMTA, 2022, 3-5 August, 2022
CSIR-Institute of Minerals and Materials Technology (IMMT), Bhubaneswar
22. Synthesis and characterization of multichromophoric PDI-NDI molecule based eelctron transport material for organic solar cell. Oral presentation
Komal Bhardwaj and Rachana Kumar
International conference on Materials Science and Technology (ICMT-2021), 12-14 Nov, 2021
Mahatma Gandhi University, Kottayam, Kerala
23. Comparative study of aliphatic vs. aromatic substituted perylenediimide as electron transport layer material. Poster presentation
Komal Bhardwaj, Samya Naqvi, Rachana Kumar
National Science Day, 28th Feb 2022, Place: CSIR-NPL, New Delhi
Third prize for best presentation
24. Modulating the aggregation behaviour of perylenediimide derivative using different imide substituent for application in organic solar cell
Poster presentation
Komal Bhardwaj, Rachana Kumar
International conference on Frontiers In Materials for Technological Applications (FIMTA-2022), 3-5 Aug, 2022, CSIR-IMMT, Bhubaneswar