

**School**: School of Physical Sciences

**Department:** Department of Chemistry

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https://www.ggu.ac.in/Admin/Files/Resume/CV Dr%20Subhash%20Banerjee.pdf

#### **Qualifications:**

 Doctor of Philosophy (Ph. D.) in Synthetic Organic Chemistry from Department of Organic Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Kolkata, India: March, 2008.

- M.Sc. (Organic Chemistry Specialization), The University of Burdwan, West Bengal, India, 2002 (1st Class).
- B. Sc. (Chemistry Honors), The University of Burdwan, West Bengal, India, 2000 (1st Class).

#### **Area of Interest/Specialization:**

- Green Synthesis: Design and Development of Green Catalysts and Reagents For Organic Transformations.
- Green Synthetic Tool: Organic Synthesis using Green Synthetic Tools Such as MW, Ball Milling, Sonicator, Visible Light etc.
- Nano-Catalysis: Development of Novel Hybrid Nanomaterials for Organic Synthesis.
- Heterogeneous Catalysis: Catalysis by MCM-41/4, SBA-15 and Carbon-Supported Metal Nanoparticles Materials, Biomass Rice Husk Derived Carbon Supported Materials.
- On-Water Synthesis: Exploration of Organic Transformations in Water.

#### **Experience:**

**Present Employment:** 

**August, 2011 – Present:** Department of Chemistry, Guru Ghasidas Vishwavidyalaya (A

Central University), Bilaspur, C. G., India

**Post Doctoral Experience:** 

June, 2009 – June, 2011: Post-Doctoral Research Associate, Department of Chemistry,

USD, South Dakota, USA

July, 2007 – May, 2009: Post-Doctoral Research Associate, NanoScience Technology

Center, UCF, Florida, USA

#### **Awards and Honors:**

• Young Scientist Award by Solid State Chemistry & Allied Area during 11<sup>th</sup> National Conference (NCSCA-2019), Nagpur, December 20-21, 2019

- **DST Fast Track Fellowship** from DST, Govt. of India, **2012**.
- USA Post Doctoral Fellowship, Department of Chemistry, The University of South Dakota, USA, June 2009 June 2011.
- **USA Post Doctoral Fellowship**, NanoScience Technology Center, The University of Central Florida, USA, July **2007** June **2009**.

#### **Research Projects:**

- Fast Track Scheme for Young Scientist from Department of Science & Technology (DST), New Delhi on "Novel Mesoporous Ru-MCM-48 materials for the Development of Green Synthetic Methodologies" (SB/FT/CS 023/2012): 25 lacs
- UGC-BSR Research Start-Up-Grant for Newly Recruited faculty from UGC, New Delhi on "Design and Synthesis of Novel Amino Acids Modified Imidazolium Based Chiral Ionic Liquids for Asymmetric Synthesis" F. No. 20-1/2012(BSR)/20-8(3)/2012(BSR): 6 lacs
- CCOST Mini Research Project on "Development of Rice-husk Feedstock Supported Nanomaterials for the Synthesis of Privileged Medicinal Scaffolds" (ENDT No 2096/CCOST/MRP/2017) dated 19.09.2017 Grant Amount 4,85,000/-

#### **International Collaboration:**

#### **Professor Swadeshmukul Santra**

Director, Materials Innovation for Sustainable Agriculture (UCF-MISA Center)

Professor, Department of Chemistry, NanoScience Technology Center, Department of Materials Science and Engineering and Burnett School of Biomedical Sciences, University of Central Florida, 4353 Scorpius St., Suite 245, Orlando, FL 32816, USA.

Email: ssantra@ucf.edu

#### Professor Sami H. Mahmood

Affiliation: Department of Physics, The University of Jordan, Amman 11942, Jordan. Department of Physics and Astronomy, Michigan State University, East Lansing, MI 48824.

Email: s.mahmood@ju.edu.jo

#### Professor Ahmed A. Abdala

Chemical Engineering Programme, Texas A & M University at Qatar POB 23784, Doha, Qatar.

Email: ahmed.abdalla@qatar.tamu.edu

#### **Professor Ranjit Koodali**

Department of Chemistry, University of South Dakota, vermillion, South Dakota, USA <a href="mailto:Email: ranjit.koodali@usd.edu">Email: ranjit.koodali@usd.edu</a>

#### **Best Peer Reviewed Publication (up-to 10)**

1. Ionic Liquid as Catalyst and Reaction Medium. The Dramatic Influence of a Task Specific Ionic Liquid [bmIm]OH in Michael Addition of Active Methylene Compounds to Conjugated Ketones, Carboxylic Esters and Nitriles

B. C. Ranu, and S. Banerjee

*Organic Letters*, **2005**, *7*, 3049-3052. (Citation: 623, Impact Factor: 6.005)

2. Hierarchical Mesoporous RuO<sub>2</sub>/Cu<sub>2</sub>O Nanoparticle-Catalyzed Oxidative Homo/Hetero Azo-Coupling of Anilines

A. Saha, S. Payra, B. Selvaratnam, S. Bhattacharya, S. Pal, R.T. Koodali, and <u>S. Banerjee\*</u>

ACS Sustainable Chemistry & Engineering, 2018, 6, 11345.

(Citation: 30, Impact Factor: 8.198)

3. One-Pot Multicomponent Synthesis of Highly Functionalized Bio-Active Pyrano[2,3-c]pyrazole and Benzylpyrazolyl Coumarin Derivatives Using ZrO<sub>2</sub> Nanoparticles as Reusable Catalyst

A. Saha, S. Payra and S. Banerjee\*

Green Chemistry, 2015, 17, 2859.

(Citation: 135, Impact Factor: 10.18)

4. A Simple Strategy for Qdot Assisted Selective Detection of Cd<sup>2+</sup>

S. Banerjee, S. Kar and S. Santra

Chemical Communications, 2008, 3037-3039.

(Citation: 80, Impact Factor: 6.222)

5. Ionic Liquid as Reagent. A Green Procedure for the Regioselective Conversion of Epoxides to *vicinal*-Halohydrins using [AcMIm]X under Catalyst- and Solvent-Free Conditions

B. C. Ranu and S. Banerjee,

Journal of Organic Chemistry, 2005, 70, 4517-4520.

(Citation: 131, Impact Factor: 4.354)

6. Indium (I) Iodide-Promoted Cleavage of Diphenyl Diselenide and Disulfide and Subsequent Palladium (0)-Catalyzed Condensation with Vinylic Bromides. A Simple One-Pot Synthesis of Vinylic Selenides and Sulfides

B. C. Ranu, K. C. Chattopadhaya and S. Banerjee

Journal of Organic Chemistry, 2006, 71, 423-425.

(Citation: 103, Impact Factor: 4.354)

7. On Water Cu@g-C<sub>3</sub>N<sub>4</sub> Catalyzed Synthesis of NH-1,2,3-Triazoles *Via* [2+3] Cycloadditions of Nitroolefins/Alkynes and Sodium Azide

S. Payra, A. Saha, and S. Banerjee\*

ChemCatChem. 2018, 10, 5468-5474.

(Citation: 35, Impact Factor: 5.686)

8. TiO<sub>2</sub>–SiO<sub>2</sub> Mixed Oxides: Organic Ligand Templated Controlled Deposition of Titania and Their Photocatalytic Activities for Hydrogen Production

R. Peng, S. Banerjee\*, G. Sereda, R. Koodali

#### International Journal of Hydrogen Energy, 2012, 37, 17009-17018.

(Citation: 25, Impact Factor: 5.816)

9. Pd-MCM-48: A Novel and Recyclable Heterogeneous Catalyst for Selective Hydrogenations and Coupling Reactions

S. Banerjee,\* V. Balasanthiran, R. Koodali and G. Sereda

Organic Biomolecular Chemistry 2010, 8, 4316-4321.

(Citation: 64, Impact Factor: 3.876)

10. Quantum Dots Based ON/OFF Probe for Detection of Glutathione

S. Banerjee, S. Kar, M. J. Pereze and S. Santra

Journal Physical Chemistry C, 2009, 113, 9659–9663.

(Citation: 109, Impact Factor: 4.126)

#### **List of Publications:**

#### **Year 2023**

- 1. Novel Pd<sub>0.1</sub>Cu<sub>0.9</sub>Co<sub>2</sub>O<sub>4</sub> nano-flake: A promising multifunctional catalyst for the electrochemical water splitting and photo-degradation reactions at ambient temperature, A. R. Patel, S.Bhagat, Neha, G. Patel, G. Maity, G. R. Turpu, A. K. Singh, S. Banerjee,\* *International Journal of Hydrogen Energy*, 2024, Vol. 51, 561-570
- 2. Nano-Catalysis in the Selective Oxidation of Alcohols and Anilines, Ashok Raj Patel, Geetika Patel, Arti Srivastava, Bhaskar Sharma, S. Banerjee\*
  Diverse Strategies for Catalytic Reactions 26, 33-58
- **3.** Review on the Synthesis of Bio-Active Spiro-Fused Heterocyclic Molecules, Geetika Patel, Ashok Raj Patel, Sameera Kheti, Parimal Kumar Sao, S. Banerjee\* *Current Organic Chemistry*, **2023** (3), 180 208.
- **4.** Sustainability of Visible Light-Driven Organic Transformations A Review G. Patel, A. R. Patel and S. Banerjee\* *Current Organic Chemistry*, **2023**, **27** (3), 166-189.
- 5. Synthesis of Oxygen and Nitrogen Containing Heterocycles using Zirconium Dioxide/Mixed Oxide Nanoparticles as Reusable Green Catalysts: A Comprehensive Update P. V. Ledade, T. L. Lambat, J. K. Gunjate, S. H. Mahmood, S. Das, A. A. Abdala, S. Banerjee\* Current Organic Chemistry, 2023, 27 (3), 223-241.

#### **Year 2022**

- 6. One-pot, three-component synthesis of novel coumarinyl-pyrazolo [3, 4-b] pyridine-3-carboxylate derivatives using [AcMIm] FeCl4 as recyclable catalyst SR Ambati, JL Patel, K Chandrakar, U Sarkar, S Penta, S Banerjee, Rajender S Varma Journal of Molecular Structure, 2022, 1268, 133623.
- 7. Application of Silver Nanoparticles as a New Alternative Antiviral Agent for SARS-CoV-2: A Review R Jamunkar, K Shrivas, D Sinha, S Patel, A Patle, A Kumar, S Banerjee\*, Current Nanoscience, 2022, 18 (4), 465-477
- 8. Development of Nanomaterials-fabricated Paper-based Sensors for the Analysis of Environmental and Biological Samples: A Review K Shrivas, TK Patle, R Jamunkar, VK Jain, S Banerjee,\* A Kumar Current Nanoscience, 2022, 18 (4), 487-498.
- Functionalized Hybrid Nanomaterials for Biomedical and Analytical Applications -S Banerjee,\* *Current Nanoscience*, 2022, 18 (4), 409-409.
   10.
- Fabrication of self-assembled Co3O4 nano-flake for one-pot synthesis of Tetrahydrobenzo [b] pyran and 1, 3-benzothazole derivatives, G. Patel, A. R. Patel, G. Maity, S. Das, S. P. Patel, S. Banerjee,\* Current Research in Green and Sustainable Chemistry, 2022, 100258.

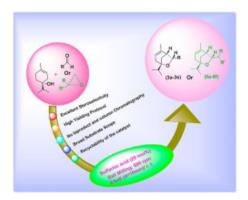


- 12. One-pot, three-component synthesis of novel coumarinyl-pyrazolo [3, 4-b] pyridine-3-carboxylate derivatives using [AcMIm] FeCl4 as recyclable catalyst SR Ambati, JL Patel, K Chandrakar, U Sarkar, S Penta, S Banerjee, Rajender S Varma Journal of Molecular Structure, 2022, 1268, 133623.
- 13. Application of Silver Nanoparticles as a New Alternative Antiviral Agent for SARS-CoV-2: A Review R Jamunkar, K Shrivas, D Sinha, S Patel, A Patle, A Kumar, S Banerjee\*, *Current Nanoscience*, 2022, 18 (4), 465-477

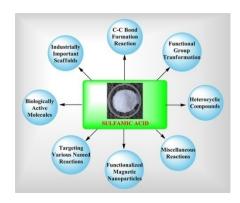
- 14. Development of Nanomaterials-fabricated Paper-based Sensors for the Analysis of Environmental and Biological Samples: A Review K Shrivas, TK Patle, R Jamunkar, VK Jain, S Banerjee,\* A Kumar Current Nanoscience, 2022, 18 (4), 487-498.
- 15. Functionalized Hybrid Nanomaterials for Biomedical and Analytical Applications S Banerjee,\* *Current Nanoscience*, 2022, *18* (4), 409-409.

#### **Year 2021**

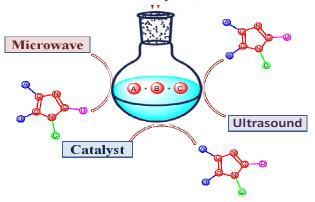
16. Sulfamic acid catalyzed oxonium-ene reactions under ball milling conditions: Straightforward access to highly functionalized Oxabicyclo [3.2.1] octenes. T. L. Lambat, S. H. Mahmood, D. Taher, <u>S. Banerjee</u>,\*Current Research in Green and Sustainable Chemistry, 2021, 100118.



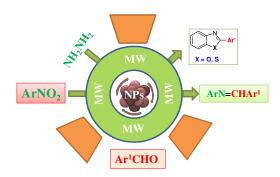
17. Sulfamic Acid as Versatile Green Catalyst Used For Synthetic Organic Chemistry: A Comprehensive Update. PKPG Chopra, TL Lambat, SH Mahmood, RG Chaudhary, Sanerjee, Chemistry Select, 2021, 6 (27), 6867-6889.



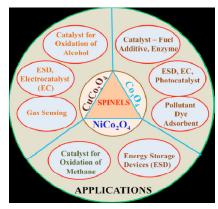
18. Green approaches for the synthesis of poly-functionalized imidazole derivatives: A comprehensive review. G Patel, DK Dewangan, N Bhakat, S Banerjee,\* Current Research in Green and Sustainable Chemistry 2021, 4, 100175.



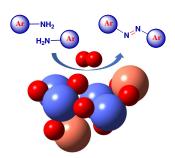
19. Direct one-pot synthesis of imines/benzothiazoles/benzoxazoles from nitroarenes via sequential hydrogenation-condensation using Nano-NiFe2O4 as catalyst under microwave irradiation, G Patel, AR Patel, TL Lambat, <u>S. Banerjee</u>,\* *Current Research in Green and Sustainable Chemistry*, 2021, 4, 100149.



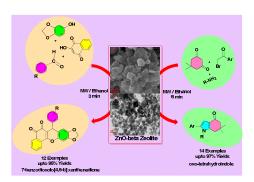
**20.** Synthesis, Characterization and Applications of Spinel Cobaltite Nanomaterials, AR Patel, G Sereda, S Banerjee, Current Pharmaceutical Biotechnology, **2021**, 22, (6), 773 – 792.



21. Direct Oxidative Azo Coupling of Anilines Using a Self-Assembled Flower-like CuCo<sub>2</sub>O<sub>4</sub> Material as a Catalyst under Aerobic Conditions. A. R. Patel, G. Patel, G. Maity, S. P. Patel, S. Bhattacharya, A. Putta, <u>S. Banerjee</u>\* *ACS omega* 2020, 5(47), 30416-30424.



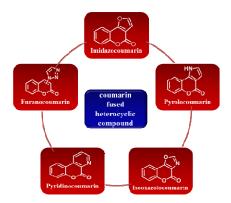
- Direct oxidative azo-coupling
- CuCo<sub>2</sub>O<sub>4</sub> nanomaterial as robust & economic catalyst
- Additive-free areal conditions
- Synergic effect of Cu & Co
- DFT calculation
- Green & sustainable synthesis
- 22. Microwave Assisted One-Pot Multicomponent Synthesis Using ZnO-β Zeolite Nanoparticle: An Easy Access to 7-Benzodioxolo[4, 5-b]xanthene-dione and 4-Oxo-tetrahydroindole Scaffolds T. L. Lambat, S. H. Mahmood, P. V. Ledade, <u>S. Banerjee</u>\* *ChemistrySelect*, 2020, 5 (28), 8864-8874



23. Visible light-emitting diode light-driven one-pot four component synthesis of polyfunctionalized imidazoles under catalyst-and solvent-free conditions – G. Patel, A. R. Patel, S. Banerjee,\* New Journal of Chemistry, 2020, 44 (31), 13295-13300.

- Visible LED light promoted MCRs
- · Metal-/acid-/base-free conditions
  - · Solvent-free reactions
- Excellent yields of products (85-98%)

**24.** Review on Synthesis of Bio-Active Coumarin-Fused Heterocyclic Molecules - G. Patel and S. Banerjee,\* *Current Organic Chemistry*, **2020**, *24* (22), 2566-2587.



25. Facile protocol for the synthesis of benzothiazole, benzoxazole and N-benzimidazole derivatives using rice husk derived chemically activated carbon – A. Asatkar, T. L. Lambat, S. Mahmood, A. Mondal, M. Singh and S. Banerjee\* - Materials Today: Proceedings, 2020, 29, 738-742.

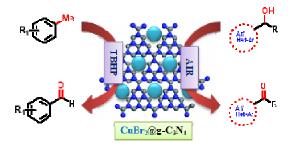
26. Biomass rice husk derived activated carbon catalyzed synthesis of 5-aryl-1, 2, 4-triazolidine-3-thione derivatives under metal-free aqueous medium – A. Asatkar, A. Saha, T. L. Lambat, M. Singh and S. Banerjee\* - *Materials Today: Proceedings*, 2020, 29, 698-703.

27. Interaction of an Acid Functionalized Magnetic Ionic Liquid with Gemini Surfactants – R. Suryawanshi, M. Kumar Banjare, K. Behera, R. K. Banjare, R. Sahu, A. Saha, S. Pandey, S. Banerjee,\* K. K. Ghosh - Journal of Solution Chemistry, 2020, 49, 715–731

- 28. Salvadora persica root extract-mediated fabrication of ZnO nanoparticles and characterization P. R. Verma, F. Khan, <u>S. Banerjee</u> *Inorganic and Nano-Metal Chemistry*, 2020, 51(3), 427-433
- 29. Rice husk derived nano-NiFe<sub>2</sub>O<sub>4</sub>@ CAGC-catalyzed direct oxidation of toluene to benzyl benzoate under visible LED light G. Patel, A. R. Patel, T. L. Lambat, S. Mahmood, S. Banerjee\* *Flat Chem.* 2020, 100163.



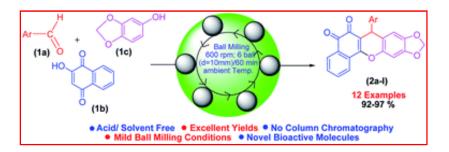
**30.** CuBr<sub>2</sub>@g-C<sub>3</sub>N<sub>4</sub>-Catalyzed Highly Selective Aerobic Oxidation of Alcohol and Toluene Derivatives – P. Rani Verma, S. Payra, F. Khan, S. Penta, <u>S.</u> Banerjee\*– *ChemistrySelect*, 2020, 5 (6), 1950-1955.



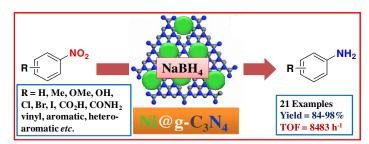
31. Synthesis of Novel Coumarinyl-pyrido[2,3-d]pyrimidine-2,4-diones Using Task-Specific Magnetic Ionic Liquid, [AcMIm]FeCl<sub>4</sub> as Catalyst –S. R. Ambati, J. L. Patel, G. Satish, K. Chandrakar, S. Penta, S. P. Mahapatra, S. Banerjee\* - Synthetic Communications, 2020, 50 (1), 104-111.

32. Visible LED Light Driven Cu<sub>0.9</sub>Fe<sub>0.1</sub>@RCAC-Catalyzed Highly Selective Aerobic Oxidation of Alcohols and Oxidative Azo-Coupling of Anilines: Tandem One Pot Oxidation-Condensation to Imidazoles and Imines - A. R. Patel, G. Patel, <u>S. Banerjee</u>\* – ACS Omega 2019, 4 (27), 22445-22455.

- **33.** Sulfamic acid promoted one pot multicomponent reaction: A facile synthesis of 4-oxotetrahydroindoles under ball milling conditions. T. L Lambat, A. A. Abdala, S. Mahmood, P. V Ledade, R. G Chaudhary, <u>Subhash Banerjee</u>\* *RSC Advances*, **2019**, 9(8), 39735-39742.
- **34.** Mesoporous PbO Nanoparticles-catalyzed Arylbenzodioxy Xanthenedione Scaffolds under Solvent-less Conditions in a Ball Mill T. L. Lambat, R. G. Chaudhary, A. A. Abdala, R. K. Mishra, S. M. and <u>S. Banerjee</u>\* *RSC Advances*, **2019**, **9**, 31683-31690.

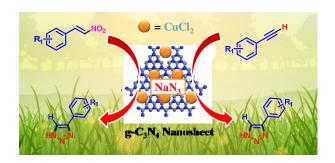


**35.** Highly Efficient and Chemoselective Reduction of Nitroarenes Using Hybrid Ni@g-C<sub>3</sub>N<sub>4</sub> as Reusable Catalyst. S Payra, A Saha, S Banerjee\* - ChemistrySelect, 2019, 4, 9556-9561.

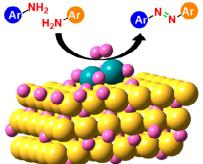


- **36.** Synthesis of Rice Husk Derived Activated Mesoporous Carbon Immobilized Palladium Hybrid Nano-Catalyst for Ligand-Free Mizoroki-Heck/Suzuki/Sonogashira Cross-Coupling Reactions A. R. Patel, A. Asatkar, G. Patel, <u>S. Banerjee</u>\* *ChemistrySelect* **2019**, *4*, 5577-5584.
- **37.** Facile Synthesis of 1,3,5-Triarylbenzenes and 4-Aryl-*NH*-1,2,3-Triazoles Using Mesoporous Pd-MCM-41 as Reusable Catalyst A. Saha, C. M. Wu, R. Peng, R. Koodali, <u>S Banerjee</u>\*– *European Journal of Organic Chemistry*, **2019**, 104-111.
- **38.** AcMIM]FeCl<sub>4</sub>: A Magnetically Separable Organocatalyst for the Clean Synthesis of Tetrahydrobenzo[*b*]pyran Derivatives A. Saha, S. Payra, A. Asatkar, A. R. Patel, <u>S.</u> Banerjee\*- *Current Organocatalysis* **2019**, *6*, 1-6.

**39.** On Water Cu@g-C<sub>3</sub>N<sub>4</sub> Catalyzed Synthesis of NH-1,2,3-Triazoles *Via* [2+3] Cycloadditions of Nitroolefins/Alkynes and Sodium Azide - S. Payra, A. Saha, and <u>S. Banerjee\* ChemCatChem.</u>, **2018**, 10, 5468–5474.



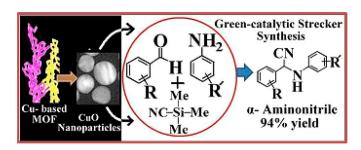
- 40. On-Water NiFe<sub>2</sub>O<sub>4</sub> Nanoparticle-Catalyzed One-Pot Synthesis of Biofunctionalized Pyrimidine-Thiazole Derivatives: In Silico Binding Affinity and In Vitro Anticancer Activity Studies A. Sharma, S. Gudala, S. R. Ambati, S. P. Mahapatra, A. Raza, S. Payra, A. Jha, A. Kumar, S. Penta, <u>S. Banerjee</u>\* *ChemistrySelect*, 2018, 3, 11012-11019.
- 41. Hierarchical Mesoporous RuO<sub>2</sub>/Cu<sub>2</sub>O Nanoparticle-Catalyzed Oxidative Homo/Hetero Azo-Coupling of Anilines- A. Saha, S. Payra, B. Selvaratnam, S. Bhattacharya, S. Pal, R.T. Koodali, and S. Banerjee\* ACS Sustainable Chemistry & Engineering, 2018, 6, 11345.



**42.** Magnetically Recoverable 10304 Nanoparticle Catalyzed One-Pot Synthesis Of Coumarin-3-Carboxamide Derivatives in Aqueous Ethanol - S Payra, A Saha, and S Banerjee\* Chemistry Select, 2018, 3, 7535–7540.



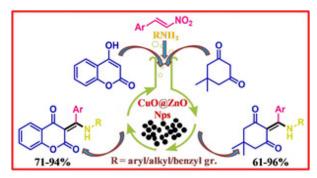
**43.** A MOF to CuO Nanospheres of Uniform Morphology for Synthesis of α-Aminonitriles under Solvent-Free Conditions along with Crystal Structure of the MOF – S. Singha, A. Saha, S. Goswami, S. K. Dey, S. Payra, S. Banerjee\*, S. Kumar, R. Saha – Crystal Growth & Design **2018**, 18, 189–199.



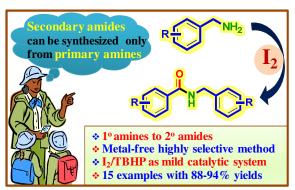
- **44.** A Review on Synthesis of Benzothiazole Derivatives <u>S Banerjee</u>\*, A Saha and S Payra *Current Organocatalysis*, **2017**, *4*, 164-181.
- **45.** Synthesis of Smart Bimetallic Nano-Cu/Ag@SiO<sub>2</sub> for Clean Oxidation of Alcohols A Saha, S Payra, S Banerjee\* *New Journal of Chemistry*, **2017**, **41**, 13377.



**46.** Fabrication of Nano-CuO@ZnO for the Synthesis of Functionalized  $\beta$ -Enaminone Derivatives from  $\beta$ -Nitrostyrenes, Aliphatic/Aromatic Amines and 1,3-Dicarbonyl/4-Hydroxy Coumarin - A. Saha, S. Payra, S. Akhtar and S. Banerjee\* - ChemistrySelect, **2017**, 2, 7319 – 7324.



**47.** Molecular-Iodine-Catalyzed Transformation of Benzyl Amines to *N*-Benzyl Benzamides *via* Oxidative Dehydrogenation/A2 like Self-Coupling and Hydration under Metal-Free Mild Conditions- A. Saha, S. Payra and <u>S. Banerjee</u>\* - *ChemistrySelect*, **2017**, 2, 3500 – 3503.



**48.** Novel Acid-functionalized Magnetic Ionic Liquid, [AcMIm]FeCl4 as Catalyst for Oxidative Hydroxylation of Arylboronic Acids and Regioselective Friedel-Craft Acylation- A. Saha, S. Payra, D. Dutta and S. Banerjee\* ChemPlusChem, 2017, 82, 1129 – 1134



- **49. Invited Review Article:** Recent Advances on Fe-Based Magnetic Nanoparticles in Organic Transformations S. Payra, A. Saha, and S. Banerjee\* Journal of Nanoscience and Nanotechnology, **2017**, *17*, 4432-4448.
- **50. Invited Review Article:** Chiral Ionic Liquids: Synthesis and Role as Efficient Green Catalyst in Asymmetric Synthesis S. Payra, A. Saha, and **S. Banerjee\*** *Current Organocatalysis*, **2017**, *4* (1), 4-32.



**51.** Efficient Room Temperature Synthesis of 2-Aryl benzimidazoles Using ZnO Nanoparticles as Reusable Catalyst – S. K. Banjare, S. Payra, A. Saha, and **S. Banerjee**\* – *Organic & Medicinal Chem I.J.* **2017**; 1(4): 555568.

**52.** In-Water Facile Synthesis of Poly-Substituted 6-Arylamino Pyridines and 2-Pyrrolidone Derivatives Using Tetragonal Nano-ZrO<sub>2</sub> as Reusable Catalyst - A Saha, S Payra, <u>S Banerjee\*</u>, *RSC Advances* **2016**, 6 (104), 101953-101959.

**53.** On-water Magnetic NiFe<sub>2</sub>O<sub>4</sub> nanoparticle-catalyzed Michael Additions of Active methylene compounds, Aromatic/Aliphatic Amines, Alcohols and Thiols to Conjugated Alkenes- S. Payra, A. Saha and S. Banerjee\* RSC Advances, **2016** 6 (98), 95951-95956.



**54.** Mesoporous Fe-SBA-15 Catalyzed Synthesis of 2-Alkoxyimidazo[1,2-a] Pyridines and Evaluation of in-Silico Selectivity and Binding Affinity to Biological Targets- S. Payra, A. Saha, C-M. Wu, B. Selvaratnam, T. Dramstad, L. Mahoney, S. K. Verma, S. Thareja, R. Koodali, **S. Banerjee\*** - *New Journal of Chemistry*, **2016. 40** (11), **9753-9760** 



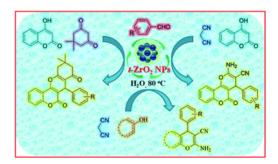
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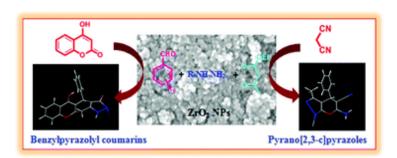


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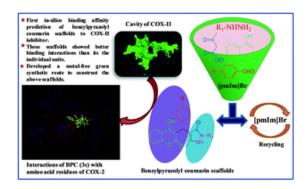
**59.** On Water Synthesis of Pyran–Chromenes *via* a Multicomponent Reactions Catalyzed by Fluorescent *t*-ZrO<sub>2</sub> Nanoparticles – A. Saha, S. Payra and <u>S. Banerjee</u>\* *RSC Advances*, **2015**, *5*, 101664-101671.



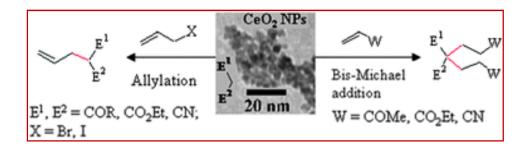
60. One-Pot Multicomponent Synthesis of Highly Functionalized Bio-Active Pyrano[2,3-c]pyrazole and Benzylpyrazolyl Coumarin Derivatives Using ZrO<sub>2</sub> Nanoparticles as Reusable Catalyst – A. Saha, S. Payra and S. Banerjee\* - Green Chemistry, 2015, 17, 2859.



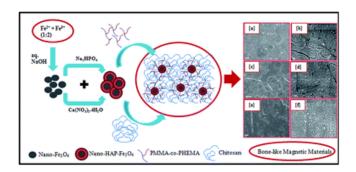
**61.** In-Silico Binding Affinity to Cyclooxygenase-II and Green Synthesis Of Benzylpyrazolyl Coumarin Derivatives - A. Saha, S. Payra, S. K. Verma, S. Thareja, and <u>S. Banerjee\*</u> *RSC Advances*, **2015**, *5*, 100978-100983.



**62.** Remarkable Catalytic Activity of Ultra Small Free-CeO<sub>2</sub> nanoparticles in Selective Carbon-Carbon Bond Formation Reactions in Water at Room Temperature – <u>S.</u> <u>Banerjee</u>\* - *New Journal of Chemistry*, **2015**, **39**, 5350 – 5353.



**63.** Novel Magnetic Antimicrobial Nanocomposites for Bone Tissue Engineering Applications – A. Bhowmick, A. Saha, N. Pramanik, S. Banerjee, M. Das and P. P. Kundu – *RSC Advances*, **2015**, **5**, 25437-25445.



**64.** Expeditious One-Pot Three Component Synthesis of *N*-aryl Dithiocarbamate Derivatives Using Mesoporous Cu-Materials – S. Payra, A. Saha, R. Peng, C.-M. Wu, R. T. Koodali, and S. Banerjee\* – *Tetrahedron Letters*, **2015** *56*, 160-1613.

This paper has been selected by the Editorial Board of SYNFACTS for its important insights: One-Pot Synthesis of N-Aryl Dithiocarbamates, Synfacts 2015, 11, 0671-0672.

- 65. ZnO nanoparticles: A green efficient catalyst for the room temperature synthesis of biologically active 2-aryl-1,3-benzothiazole and 1,3-benzoxazole derivatives S. Banerjee\*, S. Payra, A. Saha and G. Sereda Tetrahedron Letters, 2014 55(40), 5515-5520.
- 66. Free-ZnO Nanoparticles: A Mild, Efficient and Reusable Catalyst for The One-Pot Multicomponent Synthesis of Tetrahydrobenzo[b] Pyran and Dihydropyrimidone Derivatives S. Banerjee\* and A. Saha- New Journal of Chemistry 2013, 37 (12), 4170-4175.
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- 68. Morphology-Controlled Synthesis and Characterization of Magnetic Iron Oxide Nanocrystals and Their Potential Applications in Selective Oxidation of Alcohols and Olefins – <u>S. Banerjee\*</u> and S. Santra - *Journal of Catalysts*, 2013, Article ID 910489, 5 pages DOI: http://dx.doi.org/10.1155/2013/910489

- **69.** TiO<sub>2</sub>-SiO<sub>2</sub> Mixed Oxides: Organic Ligand Templated Controlled Deposition of Titania and Their Photocatalytic Activities for Hydrogen Production R. Peng, <u>S. Banerjee</u>\*, G. Sereda, R. Koodali *International Journal of Hydrogen Energy*, **2012**, *37*, 17009-17018.
- **70.** Ionic Liquid/PPh<sub>3</sub> Promoted Cleavage of Diphenyl Disulfide and Diselenide: A Straight-Forward Metal-Free One-Pot Route to the Synthesis of Unsymmetrical Sulfides and Selenides S. Banerjee, L.K. Adak, B. C. Ranu\* *Tetrahedron Letters*, **2012**, *53*, 2149-2152.

# Research Publications From Post Doctoral and Doctoral Research (2004-2011)

- 71. Design and Study of Activatable ("OFF/ON") Quantum Dots (Qdots) for Potential Biomedical Applications: Ligand Selection for Qdot Surface Modification for Controlling Qdot Fluorescence Quenching and Restoration S. Santra, S. Basumallick, R. N. Mitra, S. Banerjee, R. Shah *Proc. SPIE*. 2012, 8232 (DOI: 10.1117/12.912799).
- **72.** Synthesis of Substituted Acetylenes, Aryl Alkyl Ethers, 2-Alkene-4-Ynoates, and Nitriles Using Heterogeneous Mesoporous Pd-MCM-48 as Reusable Catalyst **S. Banerjee**,\* V. Balasanthiran, H. Khatri, R. Koodali and G. Sereda *Tetrahedron* 2011, *67*, 5717-5724.
- **73.** A Green One-Pot Multicomponent Synthesis of *4H*-Pyrans and Polysubstituted Aniline Derivatives of Biological, Pharmacological, and Optical Applications Using Silica Nanoparticles as Reusable Catalyst **S. Banerjee**,\* A. Horn, H. Khatri and G. Sereda *Tetrahedron Lett.* **2011**, *52*, 1878-1881.
- **74.** Semiconductor CdS:Mn/ZnS Quantum Dots for Sensing Applications **S. Banerjee** and S. Santra **Proc. SPIE. 2010**, **7674**,767403.
- **75.** Pd-MCM-48: A Novel and Recyclable Heterogeneous Catalyst for Selective Hydrogenations and Coupling Reactions **S. Banerjee**,\* V. Balasanthiran, R. Koodali and G. Sereda *Org. Biomol. Chem.* **2010**, *8*, 4316-4321.
- **76.** Iron Oxide Nanoparticles Grown on Carboxy-Functionalized Graphite: An Efficient Reusable Catalyst for Alkylation of Arenes V. Rajpara, **S. Banerjee**\* and G. Sereda **Synthesis 2010**, 2835-2840.

- (This paper has been selected by the Editorial Board of *SYNFACTS* for its important insights: Alkylation of Arenes with Fe<sub>3</sub>O<sub>4</sub> Nanoparticles on Oxidized Graphite, **2010**, *11*, 1320).
- 77. Silica Nanoparticles as Reusable Catalyst: A Straight-Forward Route For The Synthesis of Thioethers, Thioesters, Vinyl Thioethers and Thio-Michael Adducts Under Neutral Reaction Conditions S. Banerjee,\* J. Das, R. Alverez and S. Santra New. J. Chem. 2010, 34,302-306.
- **78.** One-Step, Three-Component Synthesis of Highly Substituted Pyridines Using Silica Nanoparticle as Reusable Catalyst <u>S. Banerjee</u>,\* and G. Sereda *Tetrahedron Lett.* **2009**, *50*, 6959-6962.
  - (This paper has been selected by the Editorial Board of *SYNFACTS* for its important insights: Three Component Synthesis of Substituted Pyridines with Silica Nanopartilees, **2010**, *1*, 0119).
- 79. Remarkable Catalytic Activity of Silica Nanoparticle in the Michael Addition of Active Methylene Compounds to Conjugated Alkenes S. Banerjee,\* and S. Santra Tetrahedron Lett. 2009, 50, 2037-2040.
  (This paper has been selected by the Editorial Board of SYNFACTS for its important insights: Novel Catalytic Activity of Silica Nanoparticles in a One Step Bis-Michael Addition SYNFACTS 2009, 7, 814.)
- **80.** Native Silica Nanoparticle Catalyzed Anti-Markovnikov Addition of Thiols to Unactivated Alkenes and Alkynes: A New Route to Linear and Vinyl Thioethers <u>S. Banerjee</u>, J. Das and S. Santra *Tetrahedron Lett.* **2009**, *50*, 124-127.
- 81. Quantum Dots Based ON/OFF Probe for Detection of Glutathione S. Banerjee, S. Kar, M. J. Pereze and S. Santra J. Phys. Chem. C. 2009, 113, 9659–9663.
- **82.** A Simple Strategy for Qdot Assisted Selective Detection of Cd<sup>2+</sup>– S. Banerjee, S. Kar and S. Santra Chem. Commun. **2008**, 3037-3039.
- 83. A Simple, Efficient and Green Protocol for the One-Pot Synthesis of Tetrahydrobenzo[b] Pyran Derivatives using a Task-Specific Ionic liquid, [bmIm]OH B. C. Ranu and <u>S. Banerjee</u> *Indian J. Chem. Soc.* 2008, 47, 1108-1112.
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- **85.** Catalysis by Ionic Liquids: Significant Rate Acceleration with the Use of [pmIm]Br in the Three-Component Synthesis of Dithiocarbamates B. C. Ranu, A. Saha and <u>S. Banerjee</u>, *Eur. J. Org. Chem.* **2008**, 519-523.

- 86. Regioselective Cross-Coupling of Allylindium Reagents with Activated Benzyl bromides

  A Simple and Efficient Procedure for the Synthesis of Terminal Alkenes B. C. Ranu,
  S. Banerjee and L. K. Adak, *Tetrahedron Lett.* 2007, 48, 7374-7379.
- 87. Ionic Liquid Promoted Regio- and Stereo-selective Thiolysis of Epoxides A Simple and Green Approach to β-Hydroxy- and β-Keto-Sulfides B. C. Ranu, T. Mandal, <u>S. Banerjee</u>, and S. S. Dey, *Aust. J. Chem.* 2007, *60*, 278-283.
- 88. Efficient Stereo and Regioselective Cleavage of Epoxides and Aziridines Using an Ionic Liquid as Reagent and Reaction Medium B. C. Ranu, L. K. Adak and S. Banerjee, Can. J. Chem. 2007, 85, 366-371.
- 89. Halogenation of Carbonyl Compounds by an Ionic Liquid, [AcMIm]X, and Ceric Ammonium Nitrate (CAN) B. C. Ranu, L. K. Adak and S. Banerjee, Aust. J. Chem. 2007, 60, 358-362.
- **90.** Ionic Liquid Promoted Stereoselective Synthesis of (*Z*)-Vinyl Bromides by [bmIm]OH under Organic Solvent Free Conditions B. C. Ranu, **S. Banerjee** and J. Gupta, *Synth. Commun.* **2007**, *37*, 2869-2976.
- 91. Significant rate Acceleration of the Aza-Michael Reaction in Water B. C. Ranu and <u>S. Banerjee</u>, *Tetrahedron Lett.* 2007, 48, 141-143.
- **92.** Ionic Liquid as Catalyst and Solvent. The Remarkable Effect of a Basic Ionic Liquid, [bmIm]OH on Michael Addition and Alkylation of Active Methylene compounds B. C. Ranu, <u>S. Banerjee</u> and R. Jana, *Tetrahedron* **2006**, *63*, 776-782.
- **93.** Homocoupling of Terminal Alkynes to 1,4-Disubstituted 1,3-Diynes Promoted by Copper(I) Iodide and a Task Specific Ionic Liquid, [bmIm]OH A Green Approach B. C. Ranu and <u>S. Banerjee</u>, *Lett. Org. Chem.* **2006**, *3*, 607-609.
- **94.** Indium Triflate Catalyzed Rearrangement of Aryl-substituted Cyclopropyl Carbinols to 1, 4-Disubstituted 1, 3-Butadienes B. C. Ranu and <u>S. Banerjee</u>, *Eur. J. Org. Chem.* **2006**, 3012-3015.
- 95. Catalysis by Ionic Liquid. A Novel, Simple and Green Protocol for the Synthesis of Substituted Conjugated Butadienes by Cyclopropyl Carbinyl Rearrangement by [pmIm]Br under Organic Solvent Free Condition B. C. Ranu, S. Banerjee and A. Das, *Tetrahedron Lett.* 2006, 47, 881-884.
- **96.** Indium (I) Iodide-Promoted Cleavage of Diphenyl Diselenide and Disulfide and Subsequent Palladium (0)-Catalyzed Condensation with Vinylic Bromides. A Simple One-Pot Synthesis of Vinylic Selenides and Sulfides B. C. Ranu, K. C. Chattopadhaya and **S. Banerjee**, *J. Org. Chem.* **2006**, *71*, 423-425.

- 97. Ionic Liquid as Catalyst and Reaction Medium. The Dramatic Influence of a Task Specific Ionic Liquid [bmIm]OH in Michael Addition of Active Methylene Compounds to Conjugated Ketones, Carboxylic Esters and Nitriles B. C. Ranu, and S. Banerjee, Org. Lett. 2005, 7, 3049-3052.
- **98.** Ionic Liquid as Reagent. A Green Procedure for the Regioselective Conversion of Epoxides to *vicinal*-Halohydrins using [AcMIm]X under Catalyst- and Solvent-Free Conditions B. C. Ranu and S. Banerjee, J. Org. Chem. **2005**, 70, 4517-4520.
- **99.** Selective Reductive Cleavage of 2,3-Epoxybromides by the InCl<sub>3</sub>-NaBH<sub>4</sub> Reagent System B. C. Ranu, **S. Banerjee** and A. Das, *Tetrahedron Lett.* **2004**, *45*, 8579-8581.

#### Recent Books/Book Chapters/Monographs.

- Hydroxyapatite Packed Chitosan-PMMA Nano-composite: A Promising Material for Construction of Synthetic Bone - A. Bhowmick, <u>S. Banerjee</u>, R. Kumar, P. P. Kundu – Multifaceted Development and Application of Biopolymers for Biology, Biomedicine and Nanotechnology Volume 254 of the Series <u>Advances in Polymer Science</u>, Publisher: Springer-Verlag Berlin Heidelberg, 2013/1/1; Page 135-167 (Impact Factor: 3.890).
- 2. Ball Milling: A Green Tool in Synthetic Organic Chemistry- S. Banerjee, G. Patel, M. K. Patel –Catalysis: Current and Future Development, Vol-1: Fundamental and Prospects of Catalysis, Publisher: Bentham Science, 20201; Page 1-203.
- 3. ZrO2-Nanoparticle-catalyzed one-pot Multicomponent Synthesis of Bio-active Organic Scaffolds S. Banerjee Chapter 17, Versatile Solicitation of Material Science in Diverse Science Fields 2021, Publisher: Nova Science Publisher Inc, 20201; Page 257-266.

## **Research Supervision**

Sl. No.	Name of Student	Research Topic/Thesis Title	Status
1.	Dr. Arijit Saha	Development of Synthetic Protocol for MCRs leading to Bio-active Molecules	Degree Awarded on April, 04, 2018  Currently, Group Leader in Syngenta, Hyderabad, Former Post-Doc under DS-Kothari Fellow at Hyderabad Central University
2.	Dr. Soumen Payra	Heterogeneous nano-Catalysts in Organic Synthesis	Degree Awarded on June 14, 2018 Currently Research Scientist at Jubilant Biosys, Greater Noida, UP, former Post doc of IIT, Madras, and IIT, Kanpur
3.	Dr. Archana Asatkar	Studies on Catalytic Activity of Biomass Rice Husk Derived Activated Carbon in Organic Transformations	Degree Awarded on January 22, 2021 Currently Working as Assistant Professor, Govt College, Raipur, CG
4	Dr. Geetika Patel	Sustainable Development of Methodologies for Organic Transformations Using Green Tools	Degree Awarded on 09.11.2022



Development of Novel Support for Nano-Catalysts and their Applications in Organic Transformations PhD (Ongoing)

Mr. Ashok Raj Patel

### **Administrative Responsibilities:**

- Coordinator of Central Store Section, GGV
- Academic Coordinator, Member of Anti-Ragging Committee
- Member of CSR committee
- Member of MoU monitoring Committee
- Member of starting of B.Voc course in the university
- Academic coordinator of department of Chemistry, GGV
- Member of Board of Studies, Dept. of Chemistry, GGV: 2018-2019
- Member of Proctor board, GGV, July 2018 to present
- Member of implementation committee of smart class/E-class room in GGV- 2019
- Subject Coordinator of CSIR-NET Coaching Class in the Dept. Of Chemistry, 2017-18
- Coordinator of Skill Development Cell of School of Physical Sciences, GGV 2016- 2019
- Member of DST-FIST Project Implementation Committee 2016-2020
- Member of Departmental Research Committee (DRC), GGV: 2013-Present
- Assistant Center Superintend in End Semester Examination, 2015, 2016, 2017
- Member of Design & Innovation Center, GGV, Bilaspur
- Assistant Center Superintend in VET, VRET, GGV, 2014, 2018
- Observer for the VET, in the Kolkata Examination Center, 2014, 2017, 2018
- Assistant Center Superintend in UGC-NET Exam., 2013
- Member of Departmental Purchase Committee, GGV, 2012-Present
- Member of Departmental Discipline Committee, GGV, 2013-Present
- Member of Scrutiny Committee for the selection of teachers in Chemistry, GGV, 2013, 2017, 2022
- Time Table in-Charge of Department of Chemistry 2013-2022
- Teacher in Charge for Preparation of Annual Report/NIRF/NAAC of Dept of Chemistry

#### **Additional Information:**

- Appointed as **Bentham Brand Ambassador 2018**
- Guest Editor of theme issue of Current Organic Chemistry, Bentham Publisher
- Guest Editor of theme issue of Current Nanoscience, Bentham Publisher
- Member of Editorial board of "Modern Research in Catalysts" (ISSN Online: 2168-4499; ISSN Print: 2168-4480), Scientific Research Publishing Inc. USA.
- Member of American Chemical Society (ACS) 2009-2011
- Member of Indian Chemical Society, 2017