



## Dr. Subhash Banerjee

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Dr. Banerjee has joined in the Department of Chemistry at Guru Ghasidas University on August, 2011. He was awarded doctoral research fellowship from Council of Scientific and Industrial Research (CSIR), India, on the basis of a nationally competitive examination (NET) in 2003. Dr. Banerjee has completed Ph.D. in Synthetic Organic Chemistry from Indian Association for the Cultivation of Science, Jadavpur, India. After that he received a post-doctoral fellowship from the NanoScience Technology Center at the University of Central Florida, USA. During this time, he was involved in several NSF funded research projects and he designed and developed quantum dot based nano-probes for nano-bio imaging and sensing. Then, he moved to the University of South Dakota, USA for his second post-doctoral research and he was mainly involved in the catalysis by nano-materials. Dr. Banerjee has published several papers in peer-reviewed international journals and also presented research works in many international symposiums. He has also been invited to review papers from several international journals such as Journal of Organic Chemistry, Tetrahedron Letters, Journal of Molecular Catalysis: A, Letters in Organic Chemistry, Chemical Papers etc. He was also a member of American Chemical Society. Dr. Banerjee has also been selected in “Who’s who in America” in 2011.

### Experience

- Assistant professor in the Department of Chemistry at Guru Ghasidas University, Bilaspur, C. G., India, August **2011** - **Present**.
- Post-doctoral research fellow, Department of Chemistry, the University of South Dakota, United States of America, June **2009** - June **2011**.
- Post-doctoral research associate, NanoScience Technology Center, the University of Central Florida, United States of America, July **2007** - May **2009**.

## Education

- Ph.D., Indian Association for the Cultivation of Science, Jadavpur, India, **2008**.
- M.Sc. (1<sup>st</sup> Class), The University of Burdwan, West Bengal, India, **2002**.
- B.Sc. (1<sup>st</sup> Class), Suri Vidyasagar College, The University of Burdwan, West Bengal, India, **2000**.

## Research Interests

- **Green Synthesis:** Design and development of green catalysts and reagents for organic transformations.
- **Nano-Catalysis:** Application of nanoparticles in organic synthesis; Catalysis by unsupported as well as solid supported metal & metal oxide nanoparticles.
- **Heterogeneous Catalysis:** Catalysis by MCM-41, MCM-48 supported precious transition metal species.
- **Photo-Catalysis:** Fabrication of inexpensive visible light activated photo-catalysts for clean hydrogen production by photo-splitting of water.

## Research Project Received

- *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**” (Registration No. CS-044/2012), Grant amount: 23 Lakhs (Excluding institute overhead).
- *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), Grant amount: 6 Lakhs.

## Awards and Honors

- Post Doctoral Fellowship, Department of Chemistry, The University of South Dakota, USA, June **2009** – June **2011**.
- Post Doctoral Fellowship, NanoScience Technology Center, The University of Central Florida, USA, July 2007 – June **2009**.

- Awarded doctoral research fellowship from Council of Scientific and Industrial Research (CSIR), India, on the basis of a nationally competitive examination (NET), **2003**.
- Awarded National Scholarship from Government of India, **1995**.

### Selected Publications

1. 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 Lett.* **2012**, *53*, 2149-2152.
2. 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.
3. A Green One-Pot Multicomponent Synthesis of 4*H*-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.
4. Semiconductor CdS:Mn/ZnS Quantum Dots for Sensing Applications – [S. Banerjee](#) and S. Santra – *Proc. SPIE.* **2010**, 7674,767403.
5. 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.
6. 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).

7. 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. Alvarez and S. Santra – *New. J. Chem.* **2010**, 34,302-306.

8. One-Step, Three-Component Synthesis of Highly Substituted Pyridines Using Silica Nanoparticle as Reusable Catalyst – **S. Banerjee**\* 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 Nanoparticles, **2010**, 1, 0119).

9. 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.)

10. Native Silica Nanoparticle Catalyzed Anti-Markovnikov Addition of Thiols to Unactivated Alkenes and Alkynes: A New Route to Linear and Vinyl Thioethers – **S. Banerjee**, J. Das and S. Santra – *Tetrahedron Lett.* **2009**, 50, 124-127.

11. Quantum Dots Based ON/OFF Probe for Detection of Glutathione – **S. Banerjee**, S. Kar, M. J. Perze and S. Santra – *J. Phys. Chem. C.* **2009**, 113, 9659–9663.

12. 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.

13. 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 **S. Banerjee** – *Indian J. Chem. Soc.* **2008**, 47, 1108-1112.

14. Ionic liquid Promoted Interrupted Feist-Benary Reaction with High Diastereoselectivity – B. C. Ranu, L. K. Adak and **S. Banerjee**, *Tetrahedron Lett.* **2008**, 49, 4613-4617.

15. 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 **S. Banerjee**, *Eur. J. Org. Chem.* **2008**, 519-523.

16. 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.

17. Ionic Liquid Promoted Regio- and Stereo-selective Thiolysis of Epoxides - A Simple and Green Approach to  $\beta$ -Hydroxy- and  $\beta$ -Keto-Sulfides – B. C. Ranu, T. Mandal, [S. Banerjee](#), and S. S. Dey, *Aust. J. Chem.* **2007**, *60*, 278-283.
18. 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.
19. 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.
20. 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.
21. Significant rate Acceleration of the Aza-Michael Reaction in Water – B. C. Ranu and [S. Banerjee](#), *Tetrahedron Lett.* **2007**, *48*, 141-143.
22. 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, [S. Banerjee](#) and R. Jana, *Tetrahedron* **2006**, *63*, 776-782.
23. 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 [S. Banerjee](#), *Lett. Org. Chem.* **2006**, *3*, 607-609.
24. Indium Triflate Catalyzed Rearrangement of Aryl-substituted Cyclopropyl Carbinols to 1, 4-Disubstituted 1, 3-Butadienes – B. C. Ranu and [S. Banerjee](#), *Eur. J. Org. Chem.* **2006**, 3012-3015.
25. 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.
26. 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. Chattopadhyaya and [S. Banerjee](#), *J. Org. Chem.* **2006**, *71*, 423-425.
27. 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.



28. 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.
29. 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.

### International Conferences/Seminars/Symposiums

1. Controlled Functionalization of Quantum Dots and Titania Nanorods with Trityl Resin as a Solid Support – [S. Banerjee](#), V. Rajpara, G. Sereda, H. Rohwer, J. D., Hoefelmeyer – Poster presentation at the **SD-EPSCoR RII Track 1 PANS AAAS Review/All Investigator Meeting and the Diversity Summit**, June 1-3, 2011, Chamberlin, South Dakota, USA
2. Controlled Functionalization of Quantum Dots and Titania Nanorods with Trityl Resin as a Solid Support – [S. Banerjee](#), V. Rajpara, G. Sereda, H. Rohwer, J. D., Hoefelmeyer – Poster presentation at the **241<sup>th</sup> ACS National Meeting & Exposition**, March 27-31, 2011, Anaheim, California, USA.
3. Pd-MCM-48: An Efficient and Versatile Heterogeneous Catalyst for Chemo- and Regioselective Hydrogenation and Coupling Reactions – [S. Banerjee](#), V. Balasanthiran, R. Koodali and G. Sereda – Oral presentation at the **241<sup>th</sup> ACS National Meeting & Exposition**, March 27-31, 2011, Anaheim, California, USA.
4. Catalysis by Loose Silica and Graphite-Supported Iron-oxide NPs – A. Horn, [S. Banerjee](#), T. Clark, V. Rajpara and G. Sereda, poster presentation at **NPURC Summer Symposium** August 6, 2010, Ponka, NE, USA.
5. Catalysis by SiO<sub>2</sub> Nanoparticles: An Efficient and Reusable Catalyst for MCR Leading to Tetrahydrobenzo[b]pyran and Anilines Derivatives – [S. Banerjee](#), A. Horn and G. Sereda, **the annual NSF EPSCoR RII All Investigator Meeting**, June 13-15, 2010, Chamberlin, South Dakota, USA.
6. Semiconductor CdS:Mn/ZnS Quantum Dots for Sensing Applications – [S. Banerjee](#) and S. Santra – **Smart Biomedical and Physiological Sensor Technologies VII**, Thursday April 8, 2010, Orlando, Florida, USA.

7. Catalysis of Ionic Organic Reactions by Oxide Nanoparticles: Effect of The Graphite Support on Their Catalytic Activity – [S. Banerjee](#), V. Rajpara and G. Sereda, Poster presentation at the **239<sup>th</sup> ACS National Meeting & Exposition**, March 21-25, 2010, San Francisco, California, USA.
8. Catalytic Activity of Loose and Graphite-Supported Oxide Nanoparticles towards Ionic Organic Reactions – [S. Banerjee](#) and G. Sereda, Poster presentation at **5<sup>th</sup> Annual Minnesota Nanotechnology Conference**, November 17-18, 2009, Minnesota, Minneapolis, USA.
9. Limited Functionalization of Quantum Dots – V. Rajpara, [S. Banerjee](#) and G. Sereda, Poster presentation at **5<sup>th</sup> Annual Minnesota Nanotechnology Conference**, November 17-18, 2009, Minnesota, Minneapolis, USA.
10. Iron Oxide Nanoparticles Deposited on Graphite as a Catalyst for Friedel – Crafts Alkylation – V. Rajpara, [S. Banerjee](#) and G. Sereda, **South Dakota/Wyoming EPSCoR State Conference**, September 23-24, 2009, Sioux Falls, South Dakota, USA.
11. Remarkable catalytic activity of Free-Silica Nanoparticles in Organic Transformations - [S. Banerjee](#) and S. Santra, Oral Presentation at the **85<sup>th</sup> annual Florida Annual Meeting and Exposition (FAME)**, May 14-16, 2009, Orlando, Florida, USA.
12. Native Silica Nanoparticles in Organic Transformations - J. Das, [S. Banerjee](#) and S. Santra, Oral Presentation at the **85<sup>th</sup> annual Florida Annual Meeting and Exposition (FAME)**, May 14-16, 2009, Orlando, Florida, USA.
13. Multimodal Quantum Dot Based Probes for Non-Invasive Bio Imaging- [S. Banerjee](#) and S. Santra, Oral Presentation at the **2<sup>nd</sup> Annual “Young Researchers Forum”**, October 2007, Gainesville, Florida, USA.

### National Symposiums

14. Tuning of the Catalytic Activity and Selectivity in Organic Reactions Using Cubic Mesoporous Pd-MCM-48- [S. Banerjee](#) – Oral Presentation at **Recent Trends in Chemistry (RTC -212)**, January 23-25, 2012, Sikkim Manipal Institute of Technology, Majitar, East Sikkim, India.
15. Ionic Liquid as Catalyst and Reaction Media: Remarkable Catalytic Activity of [bmIm]OH in Michael Addition and Alkylation of Active Methylene Compounds – [S.](#)

**Banerjee**, R. Jana and B. C. Ranu, **Poster presentation at 8<sup>th</sup> CRSI National Symposium in Chemistry (NSC – 7)**, February 3-5, 2006, IIT Bombay, India.

16. **S. Banerjee** – **Participated at National Symposium on Organic Chemistry – III (NSOC): Recent Trends and Perspectives**, February 22-23, 2006, Jadavpur University, Kolkata, West Bengal, India.
17. **S. Banerjee** – Participated at **7<sup>th</sup> CRSI National Symposium in Chemistry (NSC – 7)**, February 4-6, 2005, Indian Association for the Cultivation of Science, Jadavpur, India.