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R.B. Rakhi, Ph.D
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Education

Doctor of Philosophy (Physics): Best thesis award*, 2009*
Thesis Title: Synthesis of CNT based nanocomposites and their applications to field emission and biosensors
Department of Physics, Indian Institute of Technology Madras, Chennai, INDIA

Master of Philosophy (Physics): Grade A, 2002
University of Kerala, Kerala, INDIA

Bachelor of Education(Physical Science): 1st class, 2001
University of Kerala, Kerala, INDIA

Master of Science (Physics): **1st rank**, 1st class, 2000
University of Kerala, Kerala, INDIA

Bachelor of Science (Physics (major), Chemistry and Mathematics)***:*** 1st class, 1998
University of Kerala, Kerala, INDIA

Research Interests

- Synthesis of Graphene, Carbon nanotubes (CNTs) and carbon based nanocomposites
- Energy storage properties of carbon based nanocomposites
- Field emission properties of nanomaterials
- Biosensors
- PVDF-TrFE based capacitors.

Teaching experience

- Handled B.Tech and M.Sc. (Advanced General Physics) laboratory classes of Physics Department, IIT Madras.
- Worked as a lecturer of Physics for undergraduates in a government higher secondary school in India, for one year.

Awards and fellowships

- Obtained the **first rank in M.Sc. (Physics)** examination conducted by University of Kerala, India in 2000.
- Awarded both Junior and Senior Research Fellowships by '**Council of Scientific and Industrial Research'**, Government of India (2004) after qualifying the national level competitive examination, the Joint UGC-CSIR National Eligibility Test.
- Awarded the best poster prize in *International Symposium of Research Scholars (ISRS-2006)*, held at IIT Madras, Chennai during 18th to 20th of December, 2006.
- Secured second prize for oral presentation in the National Workshop on Nanostructured Materials and Applications, held at Stella Maris College, Chennai during 23rd to 25th of January, 2007.
- Awarded the best paper prize in *International Symposium of Research Scholars (ISRS-2008)*, held at IIT Madras, Chennai during 10th to 12th of December, 2008.
- Obtained the Prof. A.L. Laskar award for the **best Ph.D. thesis** in Physics from IIT Madras, 2009.

List of Publications

1) **R.B. Rakhi,** K. Sethupathi and S. Ramaprabhu, (2007) Effect of purity and substrate on field emission properties of multi-walled carbon nanotubes. *Nano scale Research Letters*, **2,** 331-336.

2) **R.B. Rakhi,** K. Sethupathi and S. Ramaprabhu**,** (2008) Field emission from carbon nanotubes grown on a graphitized carbon fabric compared with the same fabric with a spin coating of nanotubes. *Carbon*, **46,** 1656-1663.

3) **R.B. Rakhi,** A. Leela Mohana Reddy, M.M. Shaijumon, K. Sethupathi and S. Ramaprabhu**,** (2008) Electron field emitters based on multiwalled carbon nanotubes decorated with nanoscale metal clusters. *Journal of Nanoparticle Research*, **10,** 179-189.

4) **R.B. Rakhi,** K. Sethupathi and S. Ramaprabhu, (2008) Electron field emission properties of conducting polymer coated multi walled carbon nanotubes. *Applied Surface Science*, **254**, 6770- 6774.

5) **R.B. Rakhi,** K. Sethupathi and S. Ramaprabhu, (2008) Synthesis and Hydrogen adsorption properties of carbon nanotubes. *International Journal of Hydrogen Energy*, **33,** 381-386.

6) **R.B. Rakhi,** K. Sethupathi and S. Ramaprabhu, (2008) Electron field emitters based on multiwalled carbon nanotubes coated with conducting polymer/ metal/ metal-oxide composites. *Journal of Experimental Nanoscience*, ***4***, *67-76*.

7) **R.B. Rakhi,** K. Sethupathi and S. Ramaprabhu, (2008) Synthesis and field emission properties of polymer/metal dispersed multi walled carbon nanotubes. *Nanotrends*, **5**, 1-9.

8) **R.B. Rakhi,** K. Sethupathi and S. Ramaprabhu, (2009) A glucose biosensor based on deposition of glucose oxidase on to crystalline gold nanoparticle modified carbon nanotube electrode. *Journal of Physical Chemistry B*, **113(10)**, 3190-3194.

9) **R.B. Rakhi**, X. Lim, X. Gao, K. Sethupathi, S. Ramaprabhu and C.H. Sow **(**2010) Electron field emission from magnetic materials encapsulated multi walled carbon nanotubes. *Applied Physics A***, 98**, 195-202.

10) T. T. Baby, S. S. Jyothirmayee Aravind; T. Arockiadoss, **R.B. Rakhi** and S. Ramaprabhu; (2010) Metal decorated grapheme sheets as immobilization matrix for amperometric Glucose biosensor, *Sensors & Actuators: B*, 145(1), 71-77.

11) S. S. Jyothirmayee Aravind, T. T. Baby, T. Arockiadoss, **R.B. Rakhi** and S. Ramaprabhu; (2011) A cholesterol biosensor based on gold nanoparticles decorated functionalized graphene nanoplatelets. *Thin Solid Films*, 519 (16), 5667-5672.

12) Tessy Theres Baby**, R.B. Rakhi,** N. Ravi and S. Ramaprabhu (2011) Cerium oxide dispersed multi walled carbon nanotubes as cathode material for flexible field emitters. *Journal of Nanoscience and Nanotechnology* **(**In Press)

13) **R.B. Rakhi,** K. Sethupathi and S. Ramaprabhu (2011) Field emission properties of metal encapsulated and metal-oxide dispersed multi walled nanotube nanocomposites. *Journal of Nano Energy and Power Research* (In Press).

14) **R.B. Rakhi** and H.N. Alshareef, (2011) "Enhancement of the energy storage properties of supercapacitors using graphene nanosheets dispersed with metal oxide-loaded carbon nanotubes", *J. Power sources*. 196, 8858.

15) **R.B. Rakhi,** W. Chen, D.K. Cha, and H.N. Alshareef (2011) "High Performance Supercapacitors Using Electrodes Incorporating Metal Oxide Nanoparticles Anchored onto Graphene Nanosheets", *J. Materials Chemistry* (In Press).

16) **R.B. Rakhi,** W. Chen, D.K. Cha, and H.N. Alshareef (2011) "Energy Storage Devices with Electrodes Incorporating Carbon Nanocoils & Metal Oxide Nanoparticles", *J. Phys. Chem. C* 115 (29), 14392

17) W. Chen, **R.B. Rakhi,** M. Liangbing, Xing Xie, Y. Cui, and H.N. Alshareef (2011) "High Performance Supercapacitors on a Sponge", *Nano Letters* (In press).

18) **R.B. Rakhi,** W. Chen, D.K. Cha, and H.N. Alshareef (2011) "Nanostructured Composite Electrodes for Energy Storage Applications", *Advanced Energy Materials* (under review)