

Name

Dr. Neha Yeshwanta Hebalkar

Designation

Scientist 'D'

Qualification

Ph.D. (Chemistry)

Experience

Sept. 1997 - Aug. 1999	JRF R&DE(Engrs) DRDO, Pune
Sept. 1999 - March 2004	SRF R&DE(Engrs) DRDO, Pune
Dec. 2004 - Dec 2005	PDF DST- PDF Nanoscience and Technology, IICT, Hyderabad
Jan 2006 - Sept 2011	Scientist 'C' International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad
Oct 2011 - Till Date	Scientist 'D' ARCI, Hyderabad

Research areas of interest

Aerogels and their applications, Nanomaterial based textile finishes, Photocatalysis, Bio-medical applications of nanomaterials, x-ray photoelectron spectroscopy

Summary of work experience

- Nanomaterials - Synthesis and characterization
Metal, semiconductor and dielectric nanoparticles, their core-shell structures, hollow particles, nanoporous materials, multifunctional materials
- Technology development based on Nanomaterials
 - Aerogel based applications for thermal insulation
 - Nano titania based self-cleaning textile
 - Nano silver for antibacterial applications for textiles, water purification, medical applications.
- Other nanomaterial applications
 - Carbon aerogel based anode material for Li ion battery
 - Blood and saliva glucose sensing using surface plasmon resonance in metal nanoparticles
 - Immuno-protective stem cell encapsulation by biodegradable polymers
 - Highly porous carbon spheres for drug delivery application
- Contribution in full life cycle technology development from concept, design, application demonstration, up-scaling of the process
- Hands on experience in material characterization techniques
 - X-ray photoelectron spectroscopy
 - Transmission Electron Spectroscopy
 - BET

List of journal publications

1. Eco-friendly Ferrite Nano-Composite Photoelectrode for Improved Solar Hydrogen Generation
Rekha Dom,
G. Siva Kumar, Neha Y. Hebalkar, Shrikant V. Joshi and Pramod H. Borse
Accepted in RSC Advances, 2013 DOI: 10.1039/c0xx00000x
2. Shape evolution of perovskite LaFeO₃ nanostructures: A systematic investigation of growth mechanism, properties and morphology dependent photocatalytic activities
Thirumalairajan, S., Girija, K., Hebalkar, N.Y., Mangalaraj, D., Viswanathan, C.,
Ponpandian, N.
RSC Advances, 2013, 3 (20), 7549-7561.
3. Influence of Triethanolamine on Physico-Chemical Properties of Cadmium Sulphide Sudhir
S. Arbuji, Sagar R. Bhalerao, Sunit B. Rane, Neha Y. Hebalkar, Uttamrao P. Mulik, and

4. Deposition of nanostructured photocatalytic zinc ferrite films using solution precursor plasma spraying
Rekha Dom, G. Sivakumar, Neha Y. Hebalkar, Shrikant V. Joshi, Pramod H. Borse Materials Research Bulletin, 2012, 47 (3), 562-570
5. Synthesis of a hydrogen producing nanocrystalline ZnFe₂O₄ visible light photocatalyst using a rapid microwave irradiation method
Dom, R., Subasri, R., Hebalkar, N.Y., Chary, A.S., Borse, P.H. RSC Advances, 2012, 2(33), 12782-12791
6. Feasibility of polymer based cell encapsulation using electrostatic layer by layer assembly
Parul Garg, Tanya Debnath, Lakshmi Kiran Chelluri, Neha Hebalkar Journal of Biomaterials and Tissue Engineering, 2012, 2(3), 215-219
7. Synthesis and characterization of CuO-hybrid silica nanocomposite coatings on SS 304
Subasri, R., Malathi, R., Jyothirmayi, A., Hebalkar, N.Y. Ceramics International, 2012, 38(7), 5731-5740
8. Investigations on the mechanical properties of hybrid nanocomposite hard coatings on polycarbonate
Sowntharya, L., Lavanya, S., Chandra, G.R., Hebalkar, N.Y., Subasri, R. Ceramics International, 2012, 38(5), 4221-4228
9. Synthesis and characterization of nano silicon and titanium nitride powders using atmospheric microwave plasma technique
Kumar, S.M., Murugan, K., Chandrasekhar, S.B., Hebalkar, N., Krishna, M., Satyanarayana, B.S., Madras, G. Journal of Chemical Sciences, 2012, 124 (3) 557-563
10. Photocatalytic activity enhancement in doped titanium dioxide by crystal defects
Jaimy, K.B., Safeena, V.P., Ghosh, S., Hebalkar, N.Y., Warriar, K.G.K. Dalton Transactions, 2012, 41(16) 4824-4832
11. Preparation of bi-functional silica particles for antibacterial and self cleaning surfaces
Neha Y. Hebalkar*, Snigdhatanu Acharya, Tata N. Rao, Journal of Colloid and Interface Science 2011, 364 24–30
12. Silica – silver core shell particles for antibacterial textile application
K. Nischala, Tata. N. Rao and Neha Hebalkar Colloids and Interfaces – B : Biointerfaces, 2011, 82, 203–208

13. Effect of SiO₂ additives on the PEM fuel cell electrode performance, Senthil Velan, G. Velayutham, Neha Hebalkar, K.S. Dattathreyan, Hydrogen Energy, 2011, 36, 14815–14822 V. Int. J.
14. Highly Stabilized and Finely Dispersed Cu₂O/TiO₂: A Promising Visible Sensitive Photocatalyst for Continuous Production of Hydrogen from Glycerol:Water Mixtures Kannekanti Lalitha; Gullapelli Sadanandam, Valluri Durga Kumari, Machiraju Subrahmanyam, Bojja Sreedhar, Neha Y. Hebalkar Journal of Physical Chemistry C, 2011, 114, 22181
15. Effect of plasma surface treatment on mechanical and corrosion protection properties of UV-curable sol-gel based GPTS-ZrO₂ coatings on mild steel P. Kiruthika, R. Subasri, A. Jyothirmayi, K. Sarvani, N.Y. Hebalkar Surface & Coatings Technology 2010, 20, 41270–1276
16. Phase formation during mechanically activated annealing of nanocrystalline Cr–60at.%Al M.S. Archana, Neha Hebalkar, K. Radha, J. Joardar Journal of Alloys and Compounds 2010, 50, 118–24
17. Synthesis and surface chemistry of nano silver particles Revathi Janardhanan, Murugan Karuppaiah, Neha Hebalkar, Tata Narsinga Rao Polyhedron 2009, 28, 2522–2530
18. Synthesis and characterization of polyaniline:nanospheres, nanorods, and nanotubes—catalytic application for sulfoxidation reactions B. Sreedhara, P. Radhikaa, B. Neelima, Neha Hebalkar and M. V. Basaveswara Rao Polym. Adv. Technol. 2009, 20 950–958
19. Selective oxidation of sulfides with H₂O₂ catalyzed by silica–tungstate core–shell nanoparticles B. Sreedhar, P. Radhika, B. Neelima, Neha Hebalkar, A.K. Mishra Catalysis Communications 2008, 1039–44
20. Synthesis and characterization of silica-copper core shell nanoparticles – application for conjugate addition reactions B. Sreedhar, P. Radhika, B. Neelima, Neha Hebalkar J. Chem. – An Asian Journal, 2008 3, 163 – 1169
21. Palladium nanowire from precursor nanowire : crystal-to-crystal transformation via in situ reduction by polymer matrix S. Porel, N. Hebalkar, B. Sreedhar and T. P. Radhakrishnan Adv. Funct. Mater. 2007, 17, 2550
22. Formation and growth of molecular nanocrystals probed by their optical properties A. Patra, N. Hebalkar, B. Sreedhar and T. P. Radhakrishnan J. Phys. Chem. C, 2007, 44, 16184

23. Highly photostable dye entrapped core-shell particles
Anita S. Ethiraj, Sharmin Kharrazi, Neha Hebalkar, J. Urban, S.R. Sainkar, S.K. Kulkarni
Materials Letters, 2007, 61, 4738
24. Preparation and characterization of HAP/carboxymethyl chitosan nanocomposites
B. Sreedhar, Y. Aparna, M. Sairam, Neha Hebalkar
Journal of Applied Polymer Science, 2007, 105 (2), 928
25. Nanoengineering of surface modified silica particles to form core-shell and hollow nanospheres of iron oxide
Neha Hebalkar, P. Radhika, B. Sreedhar, M. Lakshmi Kantam
J. Nanoscience and Nanotechnology, 2007, 7, 1
26. Regioselective ring opening of epoxides with amines using monodispersed silica nanoparticles in water
B. Sreedhar, P. Radhika, B. Neelima, Neha Hebalkar
Journal of Molecular Catalysis A: Chemical, 2007, 272, 159 – 163
27. Tuning the size and optical properties in molecular nano/microcrystals : manifestation of hierarchical interactions
A. Patra, N. Hebalkar, B. Sreedhar, M. Sarkar, A. Samantaa and T. P. Radhakrishnan
Small 2006, 2, 650
28. Synthesis and characterization of mercaptoethanol capped zinc oxide nanoparticles capped with organic molecules
Chimanpure J, Ashtaputre S, Marathe S, Neha Hebalkar, S. K. Kulkarni
Synthesis and Reactivity in Inorganic Metal- Organic and Nano-Metal Chemistry, 2006, 36, 65
29. Synthesis and characterization of silica-titania core-shell particles
Suchita Kalele, Ravi Dey, Neha Hebalkar, J. Urban, S. W. Gosavi and S. K. Kulkarni
Pramana - journal of physics, 2005, 65(5), 787
30. Study of correlation of structural and surface properties with electrochemical behaviour in carbon aerogels
Neha Hebalkar, Girish Arabale, S. R. Sainkar, S. D. Pradhan, I. S. Mulla, Pushan Ayyub, K. Vijayamohanan, S. K. Kulkarni
J. Mater. Sci., 2005, 40 (14), 3777
31. Photoluminescence study of Organic dye-doped silica Nanoparticles
Anita S. Ethiraj, Neha Hebalkar, S. R. Sainkar and S. K. Kulkarni
J. Luminescence, 2005, 114 (1), 15
32. Semiconductor Nanoparticles
M. Bangal, S. Ashtaputre, S. Marathe, A. Ethiraj, N. Hebalkar, S. W. Gosabvi, J. Urban, S.

- K. Kulkarni
Hyperfine Interactions, 2005, 160 (1-4), 81
33. Optical Detection of Antibody using Silica – Silver Core-Shell Particles
S. A. Kalele, S. S. Ashtaputre, N. Y. Hebalkar, S. W. Gosavi, D.N. Deobagkar, D. D. Deobagkar, S. K. Kulkarni
Chem. Phys. Letts, 2005, 404 (1),136
 34. Structural and Optical Investigations of SiO₂-CdS Core-Shell on Silica Particles
Neha Hebalkar, Sharmin Kharazzi, Anita Ethiraj, J. Urban, R. Fink, S. K. Kulkarni
J. Colloids and Interface Science, 2004, 278(1), 107
 35. Synthesis and Investigation of ZnS nanoparticles adsorbed on functionalized silica particles Anita S. Ethiraj, Neha Hebalkar, S. R. Sainkar, J. Urban and S.K.Kulkarni
Surface Engineering, 2004, 20 (5), 367
 36. Enhancement of photoluminescence in Manganese doped ZnS nanoparticles due to a silica shell
Anita S. Ethiraj, Neha Hebalkar, Renu Pasricha, J. Urban, C. Dem, M. Schmitt, W. Kiefer, L Weinhardt, S. Joshi, R. Fink, C. Heske, C. Kumpf, E. Umbach and S. K. Kulkarni
Journal of Chemical Physics, 2003, 118(15), 8945
 37. Properties of zinc sulphide nanoparticles stabilized in silica
Neha Hebalkar, Arun Lobo, R .S. Sainkar, S.D. Pradhan, W. Vogel, J. Urban , S. K. Kulkarni
Journal of Material Science, 2001, 36, 4377
 38. Carbon aerogels
Neha Hebalkar, S. K. Kulkarni
Physics Education, 2001, 18 (1), 61

List of patents

1. Title: Improved method of producing highly stable aqueous nano titania suspension, Neha Yeshwanta Hebalkar and Tata Narasinga Rao
Indian patent, Application No. : 730/DEL/2009
2. Improved process for the preparation of stable suspension of nano silver particles having antibacterial activity, J. Revathi, Neha Hebalkar, Tata Narasinga Rao
Indian patent, Application No. : 1835/DEL/2010

3. Improved method for producing carbon containing silica aerogel granules
Neha Hebalkar
Indian patent, Application No. 2406/DEL/2010
4. Improved process for the preparation of bi-functional silica particles useful for antibacterial and self cleaning surfaces, Neha Hebalkar, Tata Narasinga Rao,
Indian patent, Application No. 3071/DEL/2010

Conferences / Workshops Attended

1. Paper presentation, "Enhancing the Photocatalytic Activity of Anatase Titania Nanoparticles and a Novel Method to Test Self Cleaning Property" Neha Hebalkar, G Raghavendra, K. Nischala, Tata N Rao, International Conference On Nanoscience & Technology, Jan 20-23 2012, Hyderabad
2. Paper presentation, "Electron Microscopy studies of bifunctional silica@titania,Ag core-shell particles", International Conference on Electron Nanoscopy, July 6-8 2011, Hyderabad
3. Indo-Austrian Symposium 2010: Advanced Materials Engineering, NFTDC, Dec 8-9, 2010
4. Paper presentation "Synthesis of silica@TiO₂:Ag core-shell particles for self cleaning and antibacterial textile applications" Neha Hebalkar, Snigdhatanu Acharya, T. N. Rao, International Workshop on Nanotechnology and Advanced Functional Materials held on July 9-11, 2009, in NCL, Pune
5. "Imaging using GATAN camera in TEM" conducted in CCMB, Hyderabad by GATAN Company, 20 Aug. 2009
6. Attended "National Conference on Showcasing Cutting Edge Science & Technology by Women : An initiative of the National Task Force for Women in Science" Organized by Ministry of Science & Technology, Govt. of India was held on 8-9 March 2008 at Vigyan Bhavan, New Delhi, on the occasion of International Women's Day.
7. International Summit on Rheology and Nanotechnology, Mumbai, 17th September, 2008
8. Paper presentation, "Tunable Synthesis and Characterization of Porous Carbon Aerogel Nanospheres" Neha Hebalkar, K. Mohanapriya, K. Radha, Tata Narasinga Rao , NanoKorea 2007, Korea, August 29 – 31 2007

9. Paper presentation, "Synthesis and Characterization of silica aerogels with transition metals", K. Mohanapriya and Neha Hebalkar International Conference on Recent Trends in Nanostructured, Materials and Their Applications, Hyderabad, December 19-20, 2007
10. Paper presentation, "Synthesis and Characterization of Mercaptoethanol Capped Zinc Oxide nanoparticles" , J. Chimanpure, S. Ashtaputre, S. Marathe, N. Hebalkar, S. Kharrazi, Renu Pasricha, S. K. Kulkarni, International Conference on Nanomaterials (Nano 2005) Sivakasi, July 13 – 15, 2005
11. Paper presentation, "Synthesis and Investigations of Cadmium Sulphide and Zinc Sulphide Nanoparticles Attached to Surface Engineered Silica Particles", Neha Hebalkar, Anita Ethiraj, Sharmin Kharezzi, J. Urban, R. Fink, S. K. Kulkarni , " International conference on advances in surface treatment : research and Applications", Hyderabad 3 – 6 Nov. 2003
12. Paper presentation, "Synthesis of Carbon Aerogels for Supercapacitor Application, Neha Hebalkar, Girish Arabale, S. R. Sainkar, S. D. Pradhan, Pushan Ayyub and S. K. Kulkarni Poster presentation in Sixth International Conference in Nanostructured Materials" Orlando, Florida, USA, 16 – 21 June 2002
13. Paper presentation, "Synthesis of Nanoporous RF Aerogels", Neha Hebalkar, S. R. Sainkar, S.D. Pradhan, and S. K. Kulkarni, National conference on science and technology of Nanomaterials and Clusters, Institute of Physics and electronics, Barkatullah University, Bhopal, MP, India., 23 – 25 Nov. 2000
14. Paper presentation, "Synthesis of Thermally Stable Zinc Sulphide Nanoparticles by Sol-Gel Method", Neha Hebalkar, Arun Lobo, R .S. Sainkar, S.D. Pradhan, W. Vogel, J. Urban , S. K. Kulkarni, National Conference on Physics of Nanophase Materials, Department of Physics, University of Pune, India, 18 – 20 Dec. 2000.

Presentations / Invited Talks

- Aerogels: Best thermal insulators, DRDL, Hyderabad, May 1, 2008
- Development of aerogels for thermal insulations and other applications, DST meeting, ARCI, Jan 13, 2009
- Aerogels: World's lightest solids, HCU, Feb 6, 2009
- Semiconductor nanoparticles : synthesis methods, JNTU, Aug 1, 2009
- Aerogels: Best thermal insulators, Vendor Meeting of BHEL, Chennai 31st Jan 2013

- Aerogels: Best thermal insulators, R&D Centre Hyundai, Hyderabad, 8th May 2013

Affiliation to Professional societies

- Member American Chemical Society

Recognitions

- Recognized Ph.D. guide in Osmania University for Chemistry
- Member of Board of Studies for graduate studies in Jawaharlal Nehru Technological University, Anantpur
- Member of American Chemical Society
- Guide to M.Sc. project students, summer project students

Contact Information

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