

## Dr.C.Ravikumar

Assistant Professor

Department of Chemical Engineering

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### Background

Post Doctoral Fellow, New Jersey Centre for Engineering Particulates, NJIT, New Jersey, USA, Sep 2012 - Jan 2014

Ph.D. (Chemical Engineering), IITKanpur (Jan'06 – June'07) (Supervisor: Prof. Rajdip Bandyopadhyaya)

(Chemical Engineering), IITBombay (July'07 – July'10) (Supervisor: Prof. Rajdip Bandyopadhyaya)

M. E. (Chemical Engineering), Annamalai University (2002-2004)

B. Tech. (Chemical Engineering), University of Madras (1999-2002)

Diploma (Petro-Chemical Technology), Technical Board of Education (1996-1999)

### Professional Experience

Assistant Professor at VNIT, Nagpur, India, March 2015 - Present

Associate Professor at Sri Sivasubramaniya Nadar (SSN) College of Engineering, Chennai, India, June 2014 – March 2015

Research Scientist, Battelle Science and Technology India Pvt. Ltd, Pune, Maharashtra, India, August 2010- August 2012

Lecturer at Vivekanandha College of Engineering for Women, Tiruchengodu, Tamilnadu, India, June 2004 - Dec 2005

### Research Interests

Colloids and Interface Science, Nanotechnology, Drug-delivery, Material Science, Modeling and Simulation, Polymers, Process Engineering, Process Intensification, Water Treatment

### Sponsored Projects:

#### Ongoing:

- **Title:** 'Nanoparticles of different shapes conjugated with drugs to achieve enhanced therapeutic efficacy in treatment of cancer'

**Role:** Principle Investigator (2017-2019), 34 Lakhs

**Sponsoring Agency:** DST-SERB Extra Mural Research, Government of India

#### Completed:

- **Title:** 'Experimental investigation of heat transfer enhancement using stable nanofluid as coolant for automobile radiators'

**Role:** Principle Investigator (2014-2015), 5.5 Lakhs

**Sponsoring Agency:** Siva Subramania Nadar Trust, Chennai

- **Title:** 'Design And Development Of Biomass Pyrolyzer With Combined Hydrotreatment For Production Of Fuel Oils'

**Role:** Principle Investigator (2014-2015), 0.25 Lakhs

**Sponsoring Agency:** Chellammal Agro Project Award, SSN College of Engineering, Chennai

### Awards and Recognitions

- IIT Bombay Best Ph.D.Thesis Award in Chemical Engineering, 2012
- Best Poster Award in Fourth Asian Particle Technology Symposium (APT 2009), 14-16 September, 2009, New Delhi, India
- Best Oral Presentation Award in Research Scholars Symposium (RSS), Chemical Engg. Dept., February, 2009, IIT Bombay
- Best Employee Award, Battelle Science and Technology India, Pune, 2012
- Certificate of Appreciation, Summer research experiences for Teachers, NJIT, USA, 2013

## Select Journal Publications

- Suganya S., Senthil Kumar P., Saravanan A., Sundar Rajan P., Ravikumar C. Computation of adsorption parameters for the removal of dye from wastewater by microwave assisted sawdust: Theoretical and experimental analysis, *Environmental Toxicology and Pharmacology*, 50, 45-57, 2017 [IF: 2.187]
- C. Ravikumar, P. Senthil Kumar, S.K. Subhashni, P.V. Tejaswini, V. Varshini. Microwave assisted fast pyrolysis of corn cob, corn stover, saw dust and rice straw: Experimental investigation on bio-oil yield and high heating values, *Sustainable Materials and Technologies*, 11, 19-27, 2017
- Tharaneedhar.V , Senthil Kumar.P, Saravanan. A. , Ravikumar.C. Jaikumar.V. Prediction and interpretation of adsorption parameters for the sequestration of methylene blue dye from aqueous solution using microwave assisted corncob activated carbon, *Sustainable Materials and Technologies*, 11, 01-11, 2017
- Madan, S.S., Wasewar, K.L., Ravi Kumar, C. Adsorption kinetics, thermodynamics, and equilibrium of alpha toluic acid onto calcium peroxide nanoparticle, *Advanced Powder Technology*, 27, 2112-2120, 2016 [IF: 2.47].
- Ravikumar, C., Kumar. S., Bandyopadhyaya, R. Aggregation of dextran coated magnetic nanoparticles in aqueous medium: Experiments and Monte Carlo simulation. *Colloids and Surfaces A: Physicochemical and Eng. Aspects*, 403, 1– 6, 2012 [IF: 2.36].
- Ravikumar, C., Bandyopadhyaya, R. Mechanistic study on magnetite nanoparticle formation in thermal decomposition and coprecipitation routes. *J. Physical Chem. C*, 115, 1380 – 1387, 2011 [IF: 4.80].
- Ravikumar, C., Singh, S.K., Bandyopadhyaya, R. Formation of nanoparticles of water-soluble molecules: Experiments and mechanism. *J. Physical Chemistry C*, 114, 8806 – 8813, 2010 [IF: 4.80].
- Kumar, S., Ravikumar, C., Bandyopadhyaya, R. State of dispersion of magnetic nanoparticles in an aqueous medium: Experiments and Monte Carlo simulation. *Langmuir*, 26, 18320 – 18330, 2010 [IF: 4.18].
- Ravikumar, C., Ethayaraja, M., Bandyopadhyaya, R. Discrete-Continuous Hybrid simulation of monodisperse nanoparticle formation. *Int. J. Chemical Sciences*, 5, 1764 – 1774, 2007 [IF: 2.36].
- Ethayaraja, M., Ravikumar.C., Muthukumaran, D., Dutta, K., Bandyopadhyaya, R. CdS-ZnS Core- Shell Nanoparticle Formation: Experiment Mechanism and Simulation. *J. Physical Chemistry C*, 111, 3246 – 3252, 2007 [IF: 4.80].

## Academic Administrative Duties

- Faculty Coordinator, 1 year B.Tech Chemical Engg. Students 'Students Mentor Program'-VNIT Nagpur, July, 2016-till date.
- Ph.D. Students Coordinator, Department of Chemical Engineering, July'2015-till date.
- B.Tech Student Project Coordinator, Department of Chemical Engineering, July'2015-July'2016.
- M.Tech class committee chairman, Department of Chemical Engineering, Jan'2016-July'2016.
- Organizing committee member-IIFEA conference-VNIT, 5-7, February, 2016
- Stage committee member-13<sup>th</sup> convocation, VNIT, Organizing committee member, 15<sup>th</sup> September'15.

## Courses Taught

- PG: Colloids and Interfacial Engineering (Autumn-Odd Semester)
- UG: Materials Science and Engineering (Spring-Even Semester), Chemical Technology (Spring), Safety and Risk Analysis (Autumn)
- Laboratory: Mass Transfer-II (In charge), Mass Transfer-I (Co-In charge), Technical Analysis (Co-In charge)

## Students

- Ph.D.: Prashil Narnaware (Joined in July-2016): Heterostructured Janus nanoparticles consisting metal and metal oxides for catalytic applications
- M.Tech: Muthu Raja.V. (Joined in July-2015): Identification of suitable polymer molecular weight to achieve better dispersions of nanoparticles in aqueous medium

## Collaborators

- Dr. Rajpal Singh Kashyap, Director of Research, Central India Institute of Medical Sciences Nagpur
- Dr. Amit Nayak, Scientist, Central India Institute of Medical Sciences Nagpur

## Invited Talks

- Nanoparticle formation in top-down approaches' VNIT Nagpur, STTP on 'Intensification in Process Industry'' VNIT Nagpur, 30<sup>th</sup> March 2016

- Nanoparticle Formation-Top down and Bottom-up approaches, Central Institute of Mining and Fuel Research, Nagpur, 29<sup>th</sup> Feb'16 (National Science Day)
- Nanotechnology, STTP on 'Recent Trends in Chemical and Biochemical Engineering'- VNIT Nagpur , 31<sup>st</sup> January 2016

#### Seminar/STTP/Workshop/Conference Organized

- STTP on 'Nanoscience and Nanotechnology'-VNIT Nagpur, 6-10<sup>th</sup> July, 2016
- One day workshop on 'Recent Practices in Chemical and Pharmaceutical Industries', SSN College of Engineering, Chennai, 19<sup>th</sup> September, 2014

#### Participation in Conferences/Presentations

- Central India Institute of Medical Sciences, Nagpur, Zoonotic diseases and Neuroinfections, 6<sup>th</sup> August, 2016
- AIChE-2013, November, 3-8, San Francisco, CA, Sub-100 nm drug particle suspensions with low media contamination prepared via an intensified wet milling process.
- AIChE-2012, October 28-November, 2, Pittsburgh, PA, Controlled magnetite nanoparticle morphology for better cellular uptake: Experiments and models.
- 85th ACS Colloid and Surface Science Symposium, Montreal, QC, Canada, June 19-22, COLLSYMP-8, 2011. Aqueous dispersion of magnetite nanoparticles: Synthesis mechanism, cellular uptake and state of dispersion.
- ICONSAT, Feb 17-20, 2010, IIT Bombay, India. Experiments and modeling of iron oxide (Fe<sub>3</sub>O<sub>4</sub>) nanoparticle uptake by HepG2 cells.
- Fourth Asian Particle Technology Symposium (APT 2009), 14-16 September, 2009, New Delhi, India. Comparison of co-precipitation and thermal decomposition routes for the preparation of poly (acrylic acid) [PAA] coated magnetite nanoparticle suspension in water.
- Research Scholars Symposium (RSS), IIT Bombay, India, 4th April 2008. Synthesis and characterization of nanoparticles for application in MRI and solar cell devices.
- Indian Chemical Engineering Congress (CHEMCON), Kolkata, India, December 27 – 30, 2007. Solvent-evaporation induced formation of nanoparticles of water-soluble molecules from a water-in-oil micro emulsion.

#### Professional Affiliations

- Organizer: Particle and Strip Film Engineering Workshop, NJIT.
- Member of American Institute of Chemical Engineers (AIChE).
- Organizer: Chemference'07, Indian Institute of Technology Kanpur, India.
- Reviewer: Advance Powder Technology, Applied Nanoscience, Crystal Growth and Design.

#### Executive Summary

Ravikumar is presently working as an Assistant Professor in Chemical Engineering Department, Visvesvaraya National Institute of Technology (VNIT), Nagpur. He has more than 10 years of experience including research, industry, and teaching. He completed his B.Tech in Chemical Engineering from University of Madras in 2002, M.E. from Annamalai University in 2004, and received his PhD from IIT Bombay in 2011. His PhD thesis on "Nanoparticle Formation in Aqueous and Organic Medium: Experiments, Mechanism and Modeling" was supervised by Prof. Rajdip Bandyopadhyaya (IITBombay), and received best thesis award in 2012 awarded by the Chemical Engineering Department, IIT Bombay. After his PhD, he worked as a research scientist at Battelle Science and Technology India, Pune for 2 years, and later moved to USA to pursue his Post Doc at New Jersey Institute of Technology (NJIT) till Jan 2014. His research include colloids and interface science, nanotechnology, material science, composites, modeling and simulation, process design, water treatment, and bio fuels. He has 9 international, 1 national and 4 conference publications to his credit. He is also recipient of other awards like best oral and poster award in 4<sup>th</sup> Asian particle technology symposium New Delhi- 2009, best oral presentation award in Research Scholar's symposium at IIT Bombay- 2009, best employee award at Battelle Science and Technology-2012. He has been reviewer of various international journals such as Advance Powder Technology, Applied Nanoscience, Crystal Growth and Design. He has organized several workshops and seminar, and actively involved in academic administrative and extra-curricular activities.