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**EDUCATIONAL QUALIFICATION:**

- B.E. (Chemical Engineering): Jadavpur University, Calcutta, 2007, 8.99 (Cumulative GPA)
- M. Tech. (Chemical Engineering): IIT Bombay, Mumbai, 2009, 9.32 (Cumulative GPA)
- PhD (Chemical Engineering): Penn State University, Univeristy Park, PA 08/2012-present, 3.81 (GPA)

**AWARDS AND ACADEMIC ACHIEVEMENTS:**

- **First Place**, DOW Sustainability Innovation Student Challenge Award (SISCA) at Penn State, 2013.
- Secured **3<sup>rd</sup> rank** among 30 students in M. Tech. (Chemical Engineering) '09, IIT Mumbai.
- Secured **3<sup>rd</sup> rank** among 70 students in B.E. (Chemical Engineering) '07, Jadavpur University.

**ACADEMIC PROJECTS:**

**MEMBRANE FOULING AND PARTICLE TRANSPORT IN SALT GRADIENTS (PhD**

**PROJECT, 01/2013-present):**

***Advisors:*** Prof. Darrell Velegol and Prof. Manish Kumar.

Particle transport in electrolyte and non-electrolyte concentration gradients is presently experimented and modeled. Particle movement and deposition on membranes (**colloidal fouling**) are studied using a combination of optical/ confocal microscopy, physics of diffusion and theories of electrokinetic flows.

**PARTICLE MICRONIZATION AND ENCAPSULATION WITH SUPERCRITICAL CARBON DIOXIDE (M. TECH. PROJECT, 01/2008-05/ 2009):**

***Advisors:*** Prof. Madhu Vinjamur; co-advised by Prof. Mamata Mukhopadhyay.

Shape selective recrystallization using supercritical **CO<sub>2</sub> anti-solvent process** was used to achieve 96% mean particle size reduction for controlled release applications. Experimental results of co-precipitation and encapsulation were corroborated through droplet nucleation and growth modeling.

**STUDIES IN MICROALGAL BIODIESEL (B. E. PROJECT, 08/2006-04/ 2007):**

***Advisor:*** Prof. Ranjana Chowdhury

Higher **algal growth** rate was achieved using carbon dioxide purging through batch cultures of green microalgae as well as cyanobacteria and their exponential growth was modeled.

**WORK EXPERIENCE:**

**SR. RESEARCH SCIENTIST, BHARAT PETROLEUM CORPORATION LIMITED (BPCL) R & D, GREATER NOIDA, INDIA (08/2009-08/2012):**

In BPCL R & D, **CO<sub>2</sub> conversions** to organic carbonates were mainly pursued. Activated carbon supported alkali carbonate/ alkali halide had been developed as an efficient and cheap alternative catalyst for dimethyl carbonate synthesis from CO<sub>2</sub>. Other assignments were developing biodegradable synthetic lubricants, technology evaluation for separation of refinery PSA (pressure swing adsorption) off gas H<sub>2</sub>/ CO<sub>2</sub> and kinetic modeling of steam methane reformer.

**PUBLICATIONS:**

- Guha R, Shang X, Zydney A, Velegol D, Kumar M. Diffusiophoresis Contributes Significantly to Colloidal Fouling in Low Salinity Reverse Osmosis Systems, *Journal of Membrane Science*, **2014**, submitted.
- Kar, A.; Guha, R.; Dani, N.; Velegol, D.; Kumar, M. Particle Deposition on Microporous Membranes can be Enhanced or Reduced by Salt Gradients, *Langmuir*, **2014** 30 (3), 793-799.
- Ahsan, M. M.; Thorat, T. S.; Gokak, D. T., Guha, R. One Step Synthesis of Dimethyl Carbonate from CO<sub>2</sub>, Propylene Oxide and Methanol on Metal Oxides and Activated Carbon Supports with K<sub>2</sub>CO<sub>3</sub>/ KBr as Active Components (in preparation).
- Guha, R.; Vinjamur, M.; Mukhopadyay, M. Demonstration of Mechanisms for Co-precipitation and Encapsulation by Supercritical Anti-Solvent Process. *Ind. Eng. Chem. Res.* **2011**, 50, 1079-1088.
- Rajarshi Guha, N. V. Choudary. 2010. Impact of Natural Gas on Petrochemicals. LKMT Workshop, Petrotech Society, New Delhi, India.