

CURRICULUM VITAE

Dr. Pramod V Rathod

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CAREER OBJECTIVES

To secure a challenging position where I can effectively utilize my knowledge, strong interpersonal skills desire to achieve and learn best. I have also demonstrated negotiating and organizing skills, a firm sense of responsibility and my capacity to work hard to accomplish my objectives. I possess excellent interpersonal skills with the ability to work independently and in a group.

RESEARCH HIGHLIGHT

- ❖ Catalytic organic synthesis, design targeted organic material synthesis, biomass conversion, heterogenous catalysts synthesis, ionic liquids synthesis, electrochromic and thermochromic material synthesis for smart window or display applications.
- ❖ Industrial experience (9th months in Vamsi Lab Ltd. Solapur, India) as a Research associate in research and development department.
 - Synthesis of Clenbuterol Hydrochloride.
 - Synthesis of Fenoterol Hydrobromide.
- ❖ Catalytic synthesis and characterization of Benzothiazole Derivatives.

EDUCATION

Ph.D. (Catalytic Organic synthesis and Electrochromic and thermochromic based smart window) Thesis submitted in Department of Energy Science and Technology, Myongji University, South Korea under the supervision of **Professor Kim Hern**, Head of Department of Energy Science and Technology.

Thesis title: “Synthesis of Ionic Liquid-based Functional Materials and their Applications in Catalytic Conversion of Biomass to Value-added Chemicals and Adaptable Solar Modulation for Smart Windows.”

- ❖ Advisor: Professor Hern Kim
- ❖ Thesis summary:

Abstract:

This study is contributed to structural modifications of ionic liquids (ILs) /or poly (ionic liquid)s (PILs) and have established as a new class of chemical compounds for the development of advanced multi-functional materials with outstanding potential in the application of several areas due to their unique properties and functionalities. Moreover,

ILs/PILs can be extensively modified through the incorporation of functional groups with specific properties into the cation, anion, or both; thus, it is possible to tune these materials to obtain a broad spectrum of multifunctional composites and address the specific requirements of various application. This work focuses on advanced materials and strategies scrutinizing ILs/PILs for the development of catalytic processes wherein it functions as solvents and/or catalysts and was also used for the fabrication of dual responsive (thermo- and electrochromic) smart windows. 1) A new catalytic system has been developed for the efficient conversion of glucose, sucrose, and fructose, to 5-HMF utilizing ionic liquids as solvent and catalyst. 2) Also, we have established a new process for synthesis of N-substituted furfurylamines from xylose/biomass-derived carbonyl compounds by using ionic liquids, which offers a metal-free alternative route. 3) And, by integrating the thermo-responsive properties of the PNIPAM segments and bistability electrochromic properties of a [MBV][I] coupled through [VBI_mBr][Br] into the main chain, we have designed and synthesized an all-in-one switchable dual responsive (thermo- and electro-chromic) PIL material that could effectively respond to temperature and electric stimuli.

- ❖ Master of Science (M.Sc.) in Organic Chemistry from Solapur University, Solapur Maharashtra, India in April 2015 with first class (66.84%).
- ❖ Bachelor of Chemistry (B.Sc.) from MMP College, Mangalwedha, Solapur University, Solapur, Maharashtra, India in April 2013 (57.44%).

RESEARCH EXPERIENCE

Graduate Assistant, Myongji University, Yongin, South Korea, March 2018-present.

❖ Advisor: **Hern Kim**

- ❖ Work on the synthesis of ionic liquid-based functional materials and their applications in catalytic conversion of biomass to value-added chemicals and adaptable solar modulation for smart windows
- ❖ Homogeneous and heterogeneous catalysis synthesis.
- ❖ Synthesis of mono-cationic, tri-cationic ionic liquids and poly(ionic liquid)s for catalytic applications in various organic reactions and dual responsive (electrochromic and thermochromic) smart window applications.
- ❖ Computer software: Expert in preparation of manuscripts, research report, and software's MS word, power point, chemdraw, and scifinder.

Project Assistant, CSIR-National Chemical Laboratory, Pune, India (Feb 2016 to Jan 2018).

- ❖ Project Title: "Application of carbohydrates chemistry towards the synthesis of bio-fuel, Isolation, Structure, Elucidation and total synthesis of natural product".
- ❖ Supervisor: **Dr. Vrushali H. Jadhav**
- ❖ Work on synthesis of value-added chemicals from biomass in presence of heterogeneous and homogenous catalysts.
- ❖ Good Ability in characterization of Organic compounds through various Spectroscopic and Analytical Techniques such as ¹H and ¹³C NMR, MASS, FT-IR, GC, HPLC, etc.

Industrial Experience, (April 2015 to Feb 2016).

- ❖ I have Nine months Industrial Experience from 'Vamsi Lab Ltd, Solapur, India' as a Research associate in Research and Development Department.
- ❖ Work on synthesis of biological active molecules or Drug's molecules.
 - 1) Synthesis of Clenbuterol Hydrochloride
 - 2) Synthesis of Fenoterol Hydrobromide.

Academic research during M.Sc. project, Solapur University, Solapur, India (2014-2015).

- ❖ Supervisor: **Dr. R.B. Bhosale**
- ❖ Project Title: Synthesis and characterization of benzothiazole derivatives.
- ❖ Experience in design and execute multi-step synthesis of targeted organic molecules and well in development of novel synthetic methodologies.

PERSONAL DETAILS

- ❖ Date of Birth : 10-06-1992
- ❖ Nationality : Indian
- ❖ Marital status : Unmarried
- ❖ Gender : Male
- ❖ Languages : English, Hindi, Marathi, Kannada and Banjara.
- ❖ Passport No. : T1769566

PUBLICATION SUMMARY

- ~ Total paper: 15
- ~ Citation: 159
- ~ H index: 7
- ~ i10 index: 6

LIST OF PUBLICATIONS

1. **Pramod V. Rathod**, Sagar D. Nale, and Vrushali H. Jadhav, Metal free acid base catalyst in the selective synthesis of 2, 5-diformylfuran (DFF) from HMF, fructose and glucose, ACS Sustainable Chemistry & Engineering 5 (1), (2017), 701-707. [SCI IF=8.198](#).
2. **Pramod V. Rathod** and Vrushali H. Jadhav, Palladium immobilize on carbonaceous catalyst for Suzuki coupling reaction in water, Tetrahedron Letters 58 (10), (2017), 1006-1009. [SCI IF=2.415](#).
3. Sagar D. Nale, **Pramod V. Rathod**, and Vrushali H. Jadhav, Manganese incorporated on glucose as an efficient catalyst for the synthesis of Adipic acid using molecular O₂ in

aqueous medium, *Applied Catalysis A: General* 546, (2017), 122-125. [SCI IF=5.706](#).

4. **Pramod V. Rathod** and Vrushali H. Jadhav, Efficient method for Synthesis of FDCA from 5-hydroxymethylfurfural and fructose Using Pd/CC catalyst under aqueous condition, *ACS Sustainable Chemistry & Engineering* 6 (5), (2018), 5766-5771, [SCI IF=8.198](#).
5. **Pramod V Rathod**, R.B. Mujmule, A.R. Jadhav, W.J. Chung, Hern Kim, Efficient dehydration of glucose, sucrose, and fructose to 5-hydroxymethylfurfural using tri-cationic ionic liquids, *Catalysis Letters*, 149, 672–687. [SCI IF=3.186](#).
6. Rajendra B. Mujmule, M.P. Raghav Rao, **Pramod V. Rathod**, Virendrakumar G. Deonikar, A. A. Chaugule, Hern Kim, Synergistic effect of a binary ionic liquid/base catalytic system for efficient conversion of epoxide and carbon dioxide into cyclic carbonates, *Journal of CO₂ utilization*, 33 (2019) 284-291. [SCI IF=7.132](#).
7. Virendrakumar G. Deonikar, **Pramod V. Rathod**, Arni M.Pornea, John Marc C. Puguan, Kyoshik Park, and Hern Kim, Hydrogen generation from catalytic hydrolysis of sodium borohydride by a Cu and Mo promoted Co catalyst, *Journal of Industrial and Engineering Chemistry*, 85 (2020) 167-177. [SCI IF=6.064](#).
8. **Pramod V Rathod**, Virendrakumar G. Deonikar, John Marc C. Puguan, and Hern Kim, Synthesis of biomass-based amines: Metal-free catalytic reductive amination of xylose and biomass-derived carbonyl compounds using pyridine-based ionic liquid/triethoxysilane, *Fuel*, 264 (2020) 116822. [SCI IF=6.609](#).
9. Virendrakumar G. Deonikar, **Pramod V. Rathod**, Arni M. Pornea, Hern Kim, Superior decontamination of toxic organic pollutants under solar light by reduced graphene oxide incorporated tetrapods-like Ag₃PO₄/MnFe₂O₄ hierarchical composites, *Journal of Environmental Management*, 256 (2020) 109930. [SCI IF=6.789](#).
10. **Pramod V. Rathod**, John Marc C. Puguan, Hern Kim, Solvent-free synthesis of propargyl amines via A³ coupling reaction and organic pollutant degradation in aqueous condition using Cu/C catalyst, *Applied Organometallic Chemistry*, 2020;34:e5986. [SCI IF=4.105](#).
11. **Pramod V. Rathod**, John Marc C. Puguan, Hern Kim, Self-bleaching dual responsive poly(ionic liquid) with optical bistability toward climate-adaptable solar modulation, *Chemical Engineering Journal*, 422 (2021) 130065. [SCI IF=13.273](#).
12. **Pramod V. Rathod**, John Marc C. Puguan, Hern Kim, Phase changing poly(ionic liquid) with electrolytic functionality for single-layer ionogel based smart window with multi-stimuli response, *Solar Energy Materials and Solar Cells*, 230 (2021) 111202. [SCI IF=7.27](#).
13. John Marc C. Puguan, **Pramod V. Rathod**, Pawan More, and Hern Kim, Highly Soluble electroactive ethylenedioxythiophene (EDOT)-based copolymer obtained via 'click' copolymerization, *Polymer*, 226 (2021) 123846. [SCI IF=4.43](#).

14. John Marc C. Puguan, **Pramod V. Rathod**, Pawan More, Hern Kim, Engineered ionene/PNIPAM hybrid dual-response material generating tunable and unique optical modes for adaptive solar transmittance modulation, ACS Applied Materials and Interfaces, 13 (30), 36330-36340. [SCI IF=9.229](#).
15. Pawan More, **Pramod V. Rathod**, John Marc C Puguan, Hern Kim, Novel highly stable metal-organic framework/viologen hybrid ionogel as multi-color electrochromic material for display application, Dyes and Pigment, 195, 109730. [SCI IF=4.889](#).

ORAL/POSTERS PRESENTED

1. **Pramod V. Rathod**, and Hern Kim, Fructose to 5-hydroxymethylfurfural conversion using metal-free heterogeneous CC-SO₃H acid catalysts in tri-cationic ionic liquid, International Conference on Functional Materials 2018 (ICFM), Shanghai, China, September 15-17, 2018.
2. **Pramod V. Rathod**, and Hern Kim, Lactate-Based Ionic Liquid Catalyzed Reductive Amination of Biomass-Derived Aldehyde/Ketones, Korean Society of Industrial and Engineering Chemistry 2018 (KSIEC), Jeju, Republic of Korea, October 31-November 02, 2018.
3. **Pramod V. Rathod**, and Hern Kim, Synthesis of biomass-based amines: Metal-free catalytic reductive amination of xylose and biomass-derived carbonyl compounds using pyridine-based ionic liquid/triethoxysilane, Korean Society of Industrial and Engineering Chemistry (KSIEC), Busan, Republic of Korea, May 02-03, 2019.
4. **Pramod V. Rathod**, and Hern Kim, Thermo- and electro-dual responsive ion gel for high-performance electrochromic devices with outstanding electrochromic switching and long-term stability, Korean Institute of Chemical Engineers (KIChE), Yeosu, Republic of Korea, Oct 14-16, 2020.
5. **Pramod V. Rathod**, and Hern Kim, Highly efficient reduction of 4-nitrophenol by biomass-derived low Cu loaded carbonaceous catalyst, Korean Institute of Chemical Engineers (KIChE), Yeosu, Republic of Korea, Oct 14-16, 2020.
6. **Pramod V. Rathod**, and Hern Kim, Phase changing poly(ionic liquid) with electrolytic functionality for a single-layer ionogel-based smart window with a multi-stimuli response, Korean Society of Industrial and Engineering Chemistry (KSIEC), Busan, Republic of Korea, May 12-15, 2021.
7. **Pramod V. Rathod**, and Hern Kim, Self-bleaching dual responsive poly(ionic liquid) with optical bistability toward climate-adaptable solar modulation, Korean society of industrial Engineering Chemistry, (KSIEC), Busan, Republic of Korea, May 12-15, 2021.

8. **Pramod V. Rathod**, and Hern Kim, Thermo- and electro-dual responsive poly(ionic liquid)s electrolyte-based smart window. Polymer Conference, Gyeongju, Oct-20-22, 2021.

REFERENCES

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