

CURRICULUM VITAE

Dr. PRATEEK KHATRI

Assistant Professor

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EDUCATION

- Postdoctoral Associate, Department of Chemical and Biological Engineering, University at Buffalo, New York, US
- Early-doc fellow (Chemical Engineering), Indian Institute of Technology-Delhi, Hauz Khas, Delhi, India
- Ph.D. (Chemical Engineering), Indian Institute of Technology-Delhi, Hauz Khas, Delhi, India
- M. Tech. (Chemical Engineering), Indian Institute of Technology-Varanasi, Uttar Pradesh, India, 2014-2016 (CPI-8.24)
- B. Tech. (Chemical Engineering), Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh, India, 2009-2013 (CPI-8.030)
- 12th Higher Secondary Education (C.B.S.E.), K.V. Paschim Vihar, Delhi, India, 2008 (69.80%)
- 10th Secondary Education (C.B.S.E.), K.V. Paschim Vihar, Delhi, India, 2006 (85.60%)

PUBLICATIONS

- **Khatri P.**, Bhatia D. Effect of gas composition on the NO_x adsorption and reduction activity of a dual-function Ag/MgO/γ-Al₂O₃ catalyst. **Applied Catalysis A: General** (2021) 618:118114. (IF: 5.706)
- **Khatri P.**, Bhatia D. Performance and Mechanistic Aspects of Ag/MgO/γ-Al₂O₃ as a Passive NO_x Adsorber. **Catalysis Letters** (2021) 1-15. (IF: 3.186)
- **Khatri P.**, Bhatia D. Effect of H₂, H₂O, and CO₂ on the deNO_x characteristics of a combined passive NO_x adsorber and NO_x reduction catalyst. **AIChE Journal** (Accepted, 2022; IF: 3.993).
- Liu CH, Porter S, Chen J, Pham H, Peterson EJ, **Khatri P.**, Toops TJ, Datye A, Kyriakidou EA. Enhanced low temperature performance of bimetallic Pd/Pt/SiO₂ (core)@ Zr (shell) diesel oxidation catalysts. **Applied Catalysis B: Environmental** (2023) 15; 327:122436. (IF: 24.43)
- **Khatri P.**, Bhatia D. Effect of Ag and MgO loadings on the NO_x adsorption-desorption and reduction characteristics of Ag/MgO/Al₂O₃. **Chemical Engineering Research and Design** (2023) accepted.

- Sehrawat R., Abdullah S., **Khatri P.**, Kumar L., Kumar A., Mujumdar A.S. Role of drying technology in probiotic encapsulation and impact on food safety. *Drying Technology* (**Accepted**, 2022; **IF: 4.452**)

CONFERENCES

- **Khatri P.**, Bhatia D., ‘Multifunctional Aftertreatment System for NO_x Adsorption and Reduction: Development and Mechanistic Insights’ Catalysis and chemical engineering conference, California, Feb 22-26, 2021 (**Oral Presentation**).
- **Khatri P.**, Bhatia D., ‘A Novel non-PGM diesel exhaust catalyst for low-temperature NO_x adsorption and high-temperature NO_x reduction’ ISCRE 26 & APCRE 9, 05-08 December, 2021 (**Poster presentation**)
- **Khatri P.**, Bhatia D., ‘Development of a Novel Passive NO_x adsorber for reduction of low-temperature NO_x emissions’ ISCRE 26 & APCRE 9, 05-08 December, 2021 (**Poster presentation**)

AWARDS AND ACADEMIC ACHIEVEMENTS

- Recipient of **DST INSPIRE FACULTY** research grant 2022 (Rs 7 lakh per year for a duration of five years).
- Secured **283 rank** in Graduate Aptitude Test in Engineering (**GATE-2016**) in Chemical Engineering. Qualified GATE exam three times as well.
- “**Certificate of appreciation**” for presenting on the topic “Multifunctional Aftertreatment System for NO_x Adsorption and Reduction: Development and Mechanistic Insights” under **Oral presentation category** in “**Catalysis and chemical engineering conference, California**” 22-26 Feb 2021.

Ph.D. THESIS WORK

Title: Dual-functional Ag/MgO/Al₂O₃ as a passive NO_x adsorber and NO_x reduction catalyst for lean-burn engines: Development and mechanistic insights

- Developed a unique dual-function Ag-based catalyst, which can work as a passive NO_x adsorber at low temperatures and a NO_x reduction catalyst at high temperatures.
- Developed a reactor setup to evaluate the catalyst performance under various reaction conditions.
- Performed various kinds of experiments such as steady-state, transient, temperature ramp, long-storage experiments, etc.
- Showed that the low-temperature NO_x adsorption activity of the developed material is similar to the much more expensive Pd-based materials.
- Investigated the role of various gas components including H₂, NH₃, C₃H₆, H₂O, and CO₂ on the NO_x adsorption-desorption and reduction characteristics of the developed catalyst.

- Proposed a mechanism involving NO_x spillover to explain the enhancement effect of H₂ on NO_x adsorption and NH₃-SCR.
- In the absence of in-situ characterization data, highlighted the use of reactor-scale data to obtain mechanistic insights

AREAS OF INTEREST

- Heterogeneous catalysis; Chemical reaction engineering
- Expertise: Automotive catalysis (PNA, SCR, LNT); Methane oxidation, Dry reforming of methane, Catalyst development, characterization, and performance evaluation; Transient catalysis

SKILLS

- **Experimental skills**
 - Development of reactor setup
 - Conducting experiments on fixed-bed and monolith reactors
 - Working on transient catalytic systems
 - Catalyst preparation
 - Catalyst characterization including XRD, TEM, HR-TEM, BET, TPR, TPD, TPSR, and ICP
- **Software** – Programming Basics in MATLAB, Origin, Fiji, ImageJ, XPSPEAK 4.1

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