

Anuj Bisht

Curriculum Vitae

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Overview

I am a chemist with extensive knowledge and research experience in heterogeneous catalysis. I also have a strong background in electrochemistry for energy conversion field. I am looking to further my research in the electro- and heterogeneous catalysis fields and also explore the fields for electrochemical energy storage.

Education

- 2013–2019 **PhD.**, Department of Chemistry, [Indian Institute of Technology Gandhinagar](#), Gandhinagar, GJ, IN.
8.12/10
- 2007–2012 **Ingerated BS-MS Degree**, Department of Chemistry, [Indian Institute of Science Education and Research Pune](#), Pune, MH India.
6.7/10

Expertise

- Catalysis and electrocatalysis techniques like XRD, BET, TEM, GC, MS, TPR/TPD/TPO, UV-Vis, FTIR, XPS, TGA-DSC, Electrochemical Potentiostat
- Fixed bed reactors, MICRO-PID reactor
- Batch reactors (Parr reactors, Amar reactors)
- Synthesis of metal oxides and doped metal oxides
- Fabricating reactor and residual gas analyzer setup for catalysis

Experience

- July 2022–ongoing **Postdoctoral Research Associate**, *Energy Science and Technology Directorate at Oak Ridge National Laboratory*, Tennessee, USA.
- Mar **Scientist**, *Atotech Development Centre Pvt Ltd*, Gurgaon, India.
- 2021–Apr 2022 Establishing the pilot line processes of Decorative and Plating on Plastic line. Optimizing the platings for Deco/PoP and working on additives for better efficiency of the processes
- Jun **Research Associate**, *IIT Gandhinagar*, Gandhinagar, India.
- 2019–Dec 2020 Developing materials for electro-reduction of CO₂ and catalytic reduction of CO₂ using metal doped nickel oxides.
- Dec **Graduate Research Assistant**, *IIT Gandhinagar*, Gandhinagar, India.
- 2013–May 2019 Lead graduate student working on heterogenous catalysis and electrocatalytic applications. Detailed achievements:
- Thesis Title: Electrocatalysis and gas solid catalysis by Pt ions in perovskites and CeO₂: A comparison between supported and the doped catalysts (Advisor: Prof. Sudhanshu Sharma);
 - Synthesized and characterized Lanthanum Doped Perovskites to study dry reforming of methane.
 - Explored the electrocatalytic and catalytic differences between doped and undoped perovskites. Explored differences between metallic platinum (Pt⁰) and ionic platinum (Pt⁴⁺/Pt²⁺) through electrochemistry and gas-solid reactions using oxygen evolution reaction, formic acid electro-oxidation, and CO-oxidation reactions;

- Jan **Jr. Research Fellow (Chemistry)**, IIT Gandhinagar, Gandhinagar, India.
2013–Nov Synthesized and characterized Lanthanum Doped Perovskites to explore catalytic and electro-
2013 catalytic properties.
- Jun **Jr. Associate Content Developer (Chemistry)**, Sankhya Learning (P) Ltd (HeyMath!),
2012–Dec Chennai, India.
2012

Scholastic and Curricular Achievements

- 2017 Awarded Overseas Exposure Fellowship at IIT Gandhinagar
- 2012 Qualified in the Graduate Aptitude Test in Engineering facilitated by the Ministry of Human Resource Development, Government of India
- 2006-2012 Awarded the Kishore Vaigyanik Protsahan Yojana fellowship

Positions of Responsibility

- Core member of Chemical Catalysis Conference (ChemCatCon 1.0) Heterogeneous Catalysis, Surface Chemistry, Interfacial Electrochemistry organized by Dr. Sudhanshu Sharma, IIT Gandhinagar (2020)
- Teaching assistant for UG Physical Chemistry Lab (2019) and PG Physical Chemistry Lab (2018)
- Volunteer in IIT Gandhinagar Electrochemistry School-2017
- Organizer of Institute Researchers' Ferret Confab (REFECO)-2015

Student Mentoring

- 2015-2017 **Aman Pandey, Ravi Shrivastava, Pradeep Yadav**, IIT Gandhinagar, Gandhinagar, India.
- Mentored project assistants, MS students and Junior PhD students
 - Mentoring on heterogenous and electrocatalytic experimental setup
 - Mentoring on material synthesis and characterization

Publications

Journal Publications:

8. **Bisht A.**, P.K. Yadav, S. Dhakar, S. Sharma, *Pt4+ as an Active Site for Oxygen Evolution Reaction in $La_{1-x}Sr_xCo_{1-y}Pt_yO_3$* , J. Phys. Chem. C, 125 (2021) 46 25488- 25496.
7. **Bisht A.**, P. Pentylala, P.A. Deshpande, S. Sharma. *$La_{0.80}Sr_{0.20}CoO_3$ as a noble- metal-free catalyst for the direct oxidation of formic acid under zero applied potential*. Electrochem. Commun., 99 (2019) 1-4.
6. **Bisht A.**, S. Sharma, *Direct formic acid electro-oxidation on Pt Doped and Undoped $La_{1-x}Sr_xCoO_3$: activity suppression due to proton reduction reaction*, J. Electrochem. Soc., 165 (2018) H927-H931.
5. **Bisht A.**, Sihag, A. Satyaprasad, S.S. Mallajosyala, S. Sharma, *Pt Metal Supported and Pt4+ Doped $La_{1-x}Sr_xCoO_3$: Non-performance of Pt4+ and Reactivity Differences with Pt Metal*, Catal. Lett., (2018) 1-13.
4. Singhal A., **Bisht A.**, S. Irusta, *Enhanced oxygen evolution activity of $Co_{3x}Ni_xO_4$ compared to Co_3O_4 by low Ni doping*, J. Electroanal. Chem., 823 (2018) 482-491.

3. Singhal A., **Bisht A.**, A. Kumar, S. Sharma, *One pot, rapid synthesis of Co_3O_4 by solution combustion method and its electrochemical properties in different electrolytes*, J. Electroanal. Chem., 776 (2016) 152-161.
2. **Bisht A.**, P. Zhang, C. Shivakumara, S. Sharma, *Pt-Doped and Pt-Supported $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$: Comparative Activity of Pt^{4+} and Pt^0 Toward the CO Poisoning Effect in Formic Acid and Methanol Electro-oxidation*, J. Phys. Chem. C, 119 (2015) 14126- 14134.
1. **Bisht A.**, B.P. Gangwar, T. Anupriya, S. Sharma, *Understanding the electrochemical differences of Pt doped and Pt supported over CeO_2* , J. Solid State Electrochem., 18 (2014) 197-206.

Conference Proceedings and Posters:.

5. *Dissoiating the formic acid over noble metal free perovskite catalyst: peculiarity of the reaction*, Energy and Environmental Challenges (CE2C)-2019. VNIT, Nagpur.
4. *Pt metal supported and Pt^{4+} doped $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$: comparative activity in formic acid and methanol electro-oxidation*, Materials for Energy Conversion and Storage 2018, IITBHU, Varanasi.
3. *Inactivity of Pt^{4+} for Carbon Monoxide Oxidation Reaction in $\text{La}_{1-x}\text{Sr}_x\text{Co}_{1-y}\text{Pt}_y\text{O}_3$ Catalyst*, Annual Workshop on Catalysis 2017, IIT (ISM) Dhanbad.
2. *Inactivity of Pt^{4+} for Carbon Monoxide Oxidation Reaction in $\text{La}_{1-x}\text{Sr}_x\text{Co}_{1-y}\text{Pt}_y\text{O}_3$ Catalyst*, 20th CRSI-National Symposium in Chemistry 2017, Guahati University.
1. *Understanding the electrochemical differences between Pt doped and Pt supported over ceria*, Chemistry Research Meet and Drug Discovery Symposium 2013, IIT Gandhinagar.