

## Curriculum Vitae

<p><b>Correspondence Address:</b></p> <p>101, Research Park, Indian Institute of Technology Gandhinagar, Gujarat-382355</p> <p><b>Permanent Address:</b></p> <p>38/shivkrupa society, godadara Surat, Gujarat India. Godadra-394210</p> <p><b>Contact Details:</b></p> <p><b>Email:</b></p> <p><a href="mailto:bhushanpatel38@outlook.com">bhushanpatel38@outlook.com</a></p> <p><b>Contact No:</b></p> <p>+91 7572956383</p> <p><b>Personal Details:</b></p> <p><b>Nationality:</b> Indian <b>Gender:</b> Male <b>Birth Date:</b> 28<sup>th</sup> Nov 2000 <b>Blood Group:</b> O+ <b>Marital status:</b> Unmarried <b>Languages known:</b> English, Gujarati, Hindi, Marathi</p>	<p><b>Mr. Bhushanbhai Narendrabhai Patel</b></p> <p><i>M.Sc. (chemistry) and (Renewable Energy &amp; Environment)</i></p> <p><i>101, Research Park, Indian Institute of Technology Gandhinagar, Gujarat-382355</i></p>	
<b>Objectives</b>		
<p>I try give my all efforts for the success of the organization and improve my learning from Failures. My Enthusiasm for research comes from the curiosity to know and learn about different areas in the field.</p>		
<b>Education Qualifications</b>		
<p><b>Sep 2024 – Present</b>      <b>Master of Science (Renewable Energy &amp; Environment)-External,</b> IGNOU, New Delhi</p> <p><b>September 2021 – May 2023</b>      <b>Master of Science (M.Sc.),</b> (May 2023, 7.70 CGPA) Tarsadia Institute of Chemical Science, Uka Tarsadia University, Bardoli, Surat Gujarat, India</p> <p><b>July 2018 – June 2021</b>      <b>Bachelor of Science (B.Sc.),</b> (June 2021, 7.58 CGPA) Tarsadia Institute of Chemical Science, Uka Tarsadia University, Bardoli, Surat, Gujarat, India.</p> <p><b>June 2016 - March 2018</b>      <b>Higher Secondary Certificate (H.S.C),</b> (March, 41.50 %) Gujarat Secondary and Higher Secondary Education Board, Gujarat, India.</p> <p><b>June 2014 - March 2016</b>      <b>Secondary School Certificate (S.S.C),</b> (March 2016, 80 %) Gujarat Secondary Education Board, Gujarat, India</p>		

## RESEARCH SKILLS

- Skilled in characterization techniques and advanced methods.
  - Knowledgeable in organic (Oxidation, Reduction and Coupling reactions). & inorganic molecule synthesis
  - Skilled in multistep organic synthesis, asymmetric synthesis, organometallic chemistry, and polymer synthesis.
  - Skilled in preparing salt, additives, electrolytes, and cathode/Anode materials for Lithium and sodium-ion batteries.
  - Expertise in NMR, IR, UV-Vis, Fluorescence and Mass Spectrometry for structural elucidation and compound identification.
  - Experienced in recrystallization, distillation, and extraction techniques for compound purification.
  - Proficiency in using software for statistical analysis and data interpretation, such as Excel, Origin, or specialized chemistry software.
  - Efficient in maintaining detailed lab notebooks and preparing comprehensive reports and SOPs.
  - Knowledgeable in chemical safety, and proper waste disposal methods.
- Passionate about research and development (R&D)

## Research Experience

- |     |   |
|-----|---|
| [1] | <p><b>Classykem (Custom Synthesis)</b><br/><b>101, Research Park, Indian Institute of Technology Gandhinagar, Gujarat-382355</b><br/><b>(R&amp;D Division)</b><br/>Position:- Jr. Research scientist<br/>Oct 2024 – Present</p> <ul style="list-style-type: none"><li>• Successfully developed assigned projects within the given time frame by conducting literature surveys, bench-scale trials, and maintaining thorough documentation.</li><li>• Synthesis, process intensification, optimization, isolation, and purification of various Active Pharmaceutical Ingredients (APIs), API intermediates, and pharmaceutical impurities.</li><li>• Designed, performed, and completed multi-step reaction projects involving complex chemistries such as: Cyclization, amination, amidation, halogenation, diazotization (Azo Dye synthesis), Sulfonation, Grignard reactions, Suzuki-coupling reactions, Nitration, high-pressure hydrogenation, oxidation, Kumada-Tamao-Corriu crosscoupling, esterification/etherification, and Ullmann reactions.</li><li>• Optimized processes by identifying critical parameters and ensuring high yield, superior quality, cost-efficiency, and operational safety.</li><li>• Scaled up reactions from 10 mg to 50 g, ensuring reproducibility and consistency across scales.</li></ul> |
| [2] | <p><b>CENTRE FOR NANO SCIENCE AND ENGINEERING (CeNSE)</b><br/><b>Indian Institute of Science, Bengaluru-560012</b><br/><b>CeNSE WINTER SCHOOL 2024</b><br/><b>Topic: A training program on semiconductor technology</b><br/>09<sup>st</sup> – 20<sup>st</sup> December 2024</p> <ul style="list-style-type: none"><li>• Attended a 2-week intensive program on semiconductor technology covering advanced topics such as cleanroom processes, lithography, doping, electrical characterization, and advanced CMOS integration.</li></ul>  |

	<ul style="list-style-type: none"> <li>• Gained hands-on exposure to tools like COMSOL, Altium, and TCAD for device modeling, simulation, and process design.</li> <li>• Participated in interactive lectures and research discussions led by eminent professors and researchers on topics including photonics integration, MEMS resonators, wafer-level packaging, and statistical process control.</li> <li>• Completed practical sessions on topics like MOSFET device modeling, CVD reactor design, and semiconductor manufacturing workflow.</li> <li>• Engaged in tests and evaluations to assess knowledge on semiconductor technology concepts.</li> <li>• Collaborated with peers in discussions and group projects, enhancing teamwork and analytical skills in semiconductor engineering.</li> </ul>
[3]	<p><b>Neogen Ionic Limited</b>  <b>Position:</b> R&amp;D chemist  Jan 2024 – October 2024</p> <ul style="list-style-type: none"> <li>• As an R&amp;D Chemist at Neogen Ionic Limited, I specialize in the preparation of lithium salts (LiI, LiBr, LiCl, and LiF) and the synthesis of advanced salts like LiPF<sub>6</sub> and LiFSI, as well as additives such as LIBOB. My role involves preparing electrolytes and optimizing cathode materials (LFP &amp; LMFP) and anode materials (LTO &amp; Black Carbon) for enhanced performance. I am adept at handling moisture-sensitive materials through glove box operations and conducting electrochemical evaluations using coin cells. Additionally, I have experience with analytical techniques like ICP-OES, XRD, HPLC, GC, and various titrations. My responsibilities include developing process flow diagrams, ensuring quality control, and maintaining regulatory compliance.</li> </ul> <ul style="list-style-type: none"> <li>❖ <b>LiPF<sub>6</sub> ML Recovery</b> <ul style="list-style-type: none"> <li>• Recovering lithium and anhydrous hydrogen fluoride (AHF) from LiPF<sub>6</sub> manufacturing byproducts.</li> <li>• Converting AHF into dihydrogen fluoride (DHF) for reuse in production processes.</li> </ul> </li> <li>❖ <b>Electrolyte Recovery</b> <ul style="list-style-type: none"> <li>• Developing processes to recover lithium and solvents such as DMC, EMC and EC from spent electrolytes, supporting sustainable battery recycling</li> <li>• Lithium recovery from the black mass of the spend battery.</li> </ul> </li> <li>❖ <b>Laboratory &amp; Chemical Handling Skills:</b> <ul style="list-style-type: none"> <li>• Expertise in handling toxic and hazardous chemicals, including HF (hydrofluoric acid), ensuring strict compliance with safety protocols.</li> <li>• Skilled in operating Glove boxes, fume hoods, and other safety-critical equipment.</li> </ul> </li> </ul>
[4]	<p><b>Personal Break (To do hydrogel work, write Review Article &amp; Prepare for IELTS at Tarsadia Institute of Chemical Science, Uka Tarsadia University, Bardoli, Surat Gujarat, India</b>  July 2023 – Dec 2023</p> <p><b>Title: - Towards Cleaner, Greener Future: Energy Efficient Sustainable Hydrogel Composites for Solar Driven Photothermal Water Evaporation and Purification</b></p>

Bhushan N. Patell, Pooja V. Devre<sup>1</sup>, Pravin R. Dongare<sup>2</sup>, Pinal S. Bhavsar<sup>1</sup>, Amrutlal L. Prajapat<sup>1</sup>, Sandip K. Patil<sup>2,3\*</sup>, Anil H. Gore<sup>1\*</sup> (**Under submission**)

**# Practical Work: -**

Biodegradable polymer-based Hydrogel  
 Characterization of hydrogels  
 Solar driven photothermal water evaporation

[5] **Internship / Dissertation**  
 15/12/2022 - 15/02/2023  
 Central Salt & Marine Chemical Research Institute (CSIR-CSMCRI), Bhavnagar Gujarat.  
 Topic:- **Rice Husk Ash: Waste utilization with value-added products**  
**(Sodium silicate, silica, silicic acid, and silicon for Silicon Wafer)**

In my MSc dissertation research work, we worked on Rice husk ash, a by-product of burning rice husks rich in silica, can be used to produce sodium silicate through a reaction with sodium hydroxide and sodium carbonate. Sodium silicate can further convert to silicic acid through hydrolysis, and this process is significant as it plays a key role in producing pure silicon, a vital component in modern technologies like electronics, solar panels, and semiconductors.

• **Experience:-**

1. Literature Survey
2. Sample preparation & Labeling
3. How to take and interpret data of XRD, IR, XRF & ICP-MS
4. How to do Organic reaction
  - Setup a Reaction
  - Work up
  - Doing a Column
  - TLC
  - NMR sample preparation
5. Knowledge about interpretation of NMR, Surface Area & Porosity Data
6. Having knowledge about preparation of NaY type of Zeolite

### **Instruments Handled**

- Manual Rolling Press Machine For Lithium Battery
- Electrode Sheet Calendering,
- Portable Manual Punching Machine
- Adjustable Lab Vacuum Coating
- UV-visible Spectrophotometer (SHIMADZU)
- GC (SHIMADZU)
- HPLC (SHIMADZU)
- WFE distillation
- Rotary Evaporator
- Ball Milling, Sonicator
- Tubular Furnace, Muffle Furnace

- Autoclave Reactor, Carousel reaction station, UV-Chamber
- Rota vapor & Industrial Rota
- Granulation Machine
- pH meter, Potentiometer, Colorimeter
- Fluorescence spectrometer
- Microwave, Hot air oven, etc.

### **Achievements and Extracurricular activities**

- Presented poster in **INTERNATIONAL CONFERENCE** on “**Recent Innovations in BIOTECHNOLOGICAL, CHEMICAL & ENVIRONMENTAL SCIENCES**” at Udaipur (15-16 March, 2023)
- **Emergency Response Team (ERT) Certification at Neogen Ionic Limited** – Gained recognition for successfully completing training in emergency preparedness, safety protocols, and incident response management, demonstrating the ability to handle critical situations in laboratory and industrial environments.
- Participated in **Samsung solve for tomorrow** (Sustainable approach to solve Pollution problem)
- Industrial visit at **Nuclear Power station at Kankrapar**, Vapi, Gujarat, India. (2022)
- Basic Safety Induction program on **Fire Safety at CSIR-CSMCRI** (2024)
- A workshop on sensitization of intellectual property- "**IP-PRENUER**" by Dr. Ajay sadashiv Thakur at Uka Tarsadia University Bardoli, Surat (March, 2023)

### **Skills**

- Strong interpersonal communication in English, Gujarati & Hindi
- Decision making ability with involving team members with motivations
- Positive attitude and can adapt me on different platform and languages quickly
- “Truth in action”. Self-motivated. Innovative approach to problem solving
- Excellent Presentation and Communication skills
- A dynamic ability to work under pressure & meet the deadlines
- Self-starter, smart-worker & task-oriented approach

### **Software Handling**

1.Chemdraw, 2. Chemskech, 3. Sci-finder, 4. MNova, 5. Origin, 6. Endnote, 7. MS Office, 8. Canva

### **References**

[1] **Dr. Anil H. Gore** (M.Sc., Ph.D. Post-Doc.)  
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[4] **Dr. Sriram Kanvah Gundimeda**  
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