

Dr. Vikas A. Patel.

Junior Scientific Officer
Sophisticated Instrumentation Centre for Applied
Research and Testing (SICART),
Vallabh Vidyanagar

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FIELD OF RESEARCH

- Growth of Nano Materials by using Pulsed Laser Deposition (PLD) Technique
- Thin Film Device fabrication and characterization.
- Working Experience as a Application Specialist on TALOAS F 200 I FEG TEM, TECNAI 20 TEM, FEG Nao Nova SEM 450, XL 30 SEM, Bruker D8 Advance Powdered XRD, Wavelength-Dispersive X-ray Fluorescence Spectrometry(WD-XRF), Axios Max(Pan Analytical)

RESEARCH EXPERTISE

- Synthesis, Characterization of Thin Films.
- Fabrication of electronic device like Memory Switching Device, Photodetector etc.
- Study on Electrical and Optical Properties of Thin Film Device.
- Characterization: XRD, TEM, SEM, EDAX, FTIR, UV Spectrophotometer, Particle Size Analyzer, Electrical and Optical Measurement Experiments.

EDUCATION

Ph.D.
(Electronics) Department of Electronic Science, Sardar Patel University, V.V .Nagar, Gujarat, India
Date of Award : March 2022
Research Guide : Prof (Miss) B. H. Patel
Thesis: Studies on Compound Semiconductor (ZnMgO) Thin film Electronic Devices

Masters of Science
(Electronics) Department of Electronic Science, Sardar Patel University, Vallabh Vidhya Nagar, Gujarat, India
Date of Award : April 2003

Bachelor of Science
(Electronics) M. B. Patel Science College, Sardar Patel University, Anand, Gujarat, India
Date of Award : April 2001

PROFESSIONAL EXPERIENCE

Sophisticated Instrumentation Centre for Applied Research and Testing (SICART) (From April 2011 to Ongoing)

Designation: Junior Scientific Officer (Microscopy)

Description:

Excellent expertise in operating, handling and maintain various sophisticated scientific instruments such as

- Talos F 200 I FEG TEM (Thermofisher)
- TECNAI 20 200 KV TEM (Philips)
- Nano Nova FEG SEM 450 (Thermofisher)
- XL 30 Series SEM (Philips)

- Bruker D-8 Advanced XRD (Bruker)
- Wavelength Dispersive X- Ray fluorescence Spectroscopy. (Pan Analytical)
- Particle Size Analysis (Sympatec)
- UV-VIS-NIR Spectrophotometer (Pekin Elmer 1050+)

❖ **Institute Of Science and Technology For Advanced Research (From 2008 to 2011)**

Designation: Assistant Network Engineer

Description: Configure and Maintain internet bandwidth Distribution of Charutar Vidya Mandal Education Trust.

❖ **CMS Computers : (March 2004 – January 2008)**

Designation: Field Engineer

Description: Computer Installation Maintain and Repair at customer site, Maintain and Configure Routers and Switches for Network distribution.

International and National Training

❖ **Nano Nova FEG SEM Course.**

November 3 -7, 2014, at FEI Nano Port in Eindhoven, the **Netherlands.**

❖ **Bruker Advanced D8 XRD Training.**

Basic Diffraction and DIFFRAC.EVA.

TOPAS Rietveld Quantification and Indexing, at Bruker India Scientific Pvt Ltd, **Bangalore.**

❖ **Tallos F 200 I FEG TEM.**

One week training program on application operation and calibration of TALOS F 200 I FEG TEM at SICART **Vallabh Vidyanagar.**

❖ **Wavelength Dispersive X-Ray Fluorescence Spectroscopy (WD_XRF).**

15 days training program on Application, Operation and calibration of WD XRF conducted by Pan Analytical at SICART Gujarat and at GMRDS **Gandhinagar.**

Participated in National & state level Conference/Workshop/Symposium/Seminar/Webinar

❖ **ICRISET-2017.**

International Conference on Research and Innovation in Science, Engineering and Technology, organized by Birla Vishvakarma Mahavidyalaya Engineering College Vallabh Vidyanagar.

Present and Publish a Paper "Fabrication of ZnMgO thin films by Pulsed Laser Deposition Method".

❖ **XXX III 2019 Gujarat Science Congress.**

Organized by L J Institute of Applied Sciences 2nd and 3rd Feb 2019.

❖ **MMETFP 2021. 19 – 21 November 2021.**

International Symposium on Materials of the Millennium: Emerging Trends and Future Prospects (**MMETFP-2021**).

Organized by Pundit Deendayal Energy University (PDEU) Gandhinagar In collaboration with Materials Research Society of India.

PUBLICATIONS

Research articles:

1. **Patel, Vikas A.**, and Basumati H. Patel. "Influence of substrate temperature on structure, stoichiometry, and energy band gap of Zn_{1-x}Mg_xO thin films deposited by pulsed laser deposition." Applied Physics A 128, no. 12 (2022): 1-7.
2. **Vikas Patel**, Basumati Patel, Dhananjay Dhruv, Vishal Dhamecha, and Andrzej Nowicki; Bipolar resistive switching behavior in Pt/Zn_{1-x}Mg_xO/pyrographite /Pt structure for memory application "Journal of Materials Science: Materials in Electronics" 2022-08-23, DOI: 10.1007/s10854-022-08921-3.
3. **Patel Vikas**, and Basumati H. Patel. "Photo sensing performance with electro-optically efficient n-Zn_{1-x}Mg_xO/p-Si heterojunction." Journal of Materials Science: Materials in Electronics 32, no. 12 (2021): 15615-15621.

4. Pataniya, Pratik M., **Vikas Patel**, Parikshit Sahatiya, Dattatray J. Late, and C. K. Sumesh. "Hydrogen Evolution Reaction in Acidic and Basic Medium on Robust Cobalt Sulphide Electrocatalyst." *Surfaces and Interfaces* (2022): 102319.
5. Pataniya, Pratik M., Shweta Dabhi, **Vikas Patel**, and C. K. Sumesh. "Liquid phase exfoliated ReS₂ nanocrystals on Paper based Electrodes for Hydrogen Evolution and Supercapacitor Applications." *Surfaces and Interfaces* (2022): 102318.
6. Pataniya, Pratik M., Sanjay A. Bhakhar, Mohit Tannarana, Chetan Zankat, **Vikas Patel**, G. K. Solanki, K. D. Patel, Prafulla K. Jha, Dattatray J. Late, and C. K. Sumesh. "Highly sensitive and flexible pressure sensor based on two-dimensional MoSe₂ nanosheets for online wrist pulse monitoring." *Journal of colloid and interface science* 584 (2021): 495-504.
7. Kannichankandy, Drishya, Pratik M. Pataniya, Som Narayan, **Vikas Patel**, C. K. Sumesh, Kireet D. Patel, Gunvant K. Solanki, and Vivek M. Pathak. "Flexible piezo-resistive pressure sensor based on conducting PANI on paper substrate." *Synthetic Metals* 273 (2021): 116697.
8. Pataniya, Pratik M., **Vikas Patel**, and C. K. Sumesh. "MoS₂/WSe₂ nanohybrids for flexible paper-based photodetectors." *Nanotechnology* 32, no. 31 (2021): 315709.
9. Pataniya, Pratik M., **Vikas Patel**, and C. K. Sumesh. "Electrophoretic Deposition of MoSe₂-MoO_x Nanosheets for Enhanced Electrocatalytic Hydrogen Evolution Reaction." *ACS Applied Energy Materials* 4, no. 8 (2021): 7891-7899.
10. Chauhan, Payal, Alkesh B. Patel, G. K. Solanki, Hiren K. Machhi, C. K. Sumesh, Saurabh S. Soni, **Vikas Patel**, and V. M. Pathak. "Ultrasonically exfoliated nanocrystal-based Z-scheme SnSe₂/WSe₂ heterojunction for a superior electrochemical photoresponse." *The Journal of Physical Chemistry C* 125, no. 27 (2021): 14729-14740.
11. Modi, Krishna H., Pratik M. Pataniya, **Vikas Patel**, and C. K. Sumesh. "Microwave assisted synthesis of SnS nanosheets for fabrication of large area SnS/Si heterojunction." *Solar Energy* 221 (2021): 412-417.
12. Chauhan, Payal, Alkesh B. Patel, Som Narayan, Jyoti Prasad, C. K. Sumesh, G. K. Solanki, K. D. Patel, **Vikas Patel** et al. "Superior electrochemical activity of CdSe thin film by chromium substitutional doping." *Journal of Alloys and Compounds* 862 (2021): 158016.
13. Chauhan, Payal, Alkesh B. Patel, Gunvant K. Solanki, Hiren K. Machhi, Saurabh S. Soni, Vivek M. Pathak, **Vikas Patel**, Som Narayan, and Prafulla K. Jha. "Flexible Self-Powered Electrochemical Photodetector Functionalized by Multilayered Tantalum Diselenide Nanocrystals." *Advanced Optical Materials* 9, no. 22 (2021): 2100993.
14. Pataniya, Pratik M., Bhautik M. Soni, G. K. Solanki, **Vikas Patel**, and Challappally Kesav Sumesh. "Photodetector based on liquid phase exfoliated SnSe quantum dots." *Optical Materials* 125 (2022): 112110.
15. Modi, Krishna H., Pratik M. Pataniya, **Vikas Patel**, and C. K. Sumesh. "Self-powered photodetector functionalized by SnS quantum dots." *Optical Materials* 129 (2022): 112504.
16. Patel, Meswa, Pratik M. Pataniya, **Vikas Patel**, and C. K. Sumesh. "Flexible photodetector based on Graphite/ZnO-WS₂ nanohybrids on paper." *Journal of Materials Science: Materials in Electronics* (2022): 1-11.
17. Chauhan, Badal L., Sanjay A. Bhakhar, Pratik M. Pataniya, Shubham U. Gupta, G. K. Solanki, V. M. Pathak, and **Vikas Patel**. "Liquid-phase exfoliation of WSe₂ nanosheets

for ITO/WSe₂ photodetector." Journal of Materials Science: Materials in Electronics 33, no. 13 (2022): 10314-10322.

18. Joshi, Kinjal K., Pratik M. Pataniya, **Vikas Patel**, and C. K. Sumesh. "Large-area binder free synthesis of Cu₂CoSnS₄ on Ag-substrate for electrocatalytic hydrogen evolution." Surfaces and Interfaces 29 (2022): 101807.
19. Patel, Alkesh B., Jayraj V. Vaghasiya, Payal Chauhan, C. K. Sumesh, **Vikas Patel**, Saurabh S. Soni, Kireetkumar D. Patel, Parveen Garg, Gunvant K. Solanki, and Vivek M. Pathak. "Synergistic 2D MoSe₂@ WSe₂ nanohybrid heterostructure toward superior hydrogen evolution and flexible supercapacitor." Nanoscale 14, no. 17 (2022): 6636-6647.
20. Chauhan, Payal, Alkesh B. Patel, G. K. Solanki, Hiren K. Machhi, C. K. Sumesh, Saurabh S. Soni, **Vikas Patel**, and V. M. Pathak. "Ultrasonically Exfoliated Nanocrystal-Based Z-Scheme SnSe₂/WSe₂ Heterojunction for a Superior Electrochemical Photoresponse." (2021).

PERSONAL DETAILS

Present Address : B-26, Nilkanth Tenaments,
H.M. Patel Statue Road
Vallabh Vidyanagar – 388 120
Dist. – Anand, Gujarat, India

Permanent Address : Moti Khadki, Po : Kasor (Bhalej)
PIN – 388 450
Ta & Dist. – Anand, Gujarat, India

Gender : Male

Language Proficiency : English, Hindi, Gujarati

DOB : 11th May, 1979

Nationality : Indian

DECLARATION

I hereby declare that the above-mentioned information is true to the best of my knowledge.

Thank You,



Place: Vallabh Vidyanagar

Dr. Vikas .A. Patel