Curriculum Vitae of Dr. C K Sumesh

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Education and Professional Experience

Academic Qualification (Undergraduate Onwards)

B. Sc. (Physics), Kannur University, Kerala, 2001

M.Sc. (Physics), Sardar Patel University, Vallabh Vidyanagr, Anand, Gujarat, 2003

Ph.D.(Physics), Sardar Patel University, Vallabh Vidyanagr, Anand, Gujarat, 2009

Work experience (in chronological order): Total Experience 14 Years

Assistant Professor: Charotar University of Science and Technology, CHARUSAT; January, 2009-January 2020

Associate Professor: Charotar University of Science and Technology, CHARUSAT; February, 2020 Till to date

Dean Faculty of Science: Charotar University of Science and Technology, CHARUSAT; September, 2020 September, 2022

Research Area

Design and development of functional nanomaterials and hybrid heterostructures for energy harvesting and storage applications

- Electrochemical water splitting and green H_2 production
- Energy storage devices: Supercapacitor, battery
- Eco-friendly paper electronics, Flexible and wearable nanoelectronics
- Light harvesting devices: Broad-band and self-powered photodetectors

- Advanced oxidation approaches: Wastewater remediation
- Electrochemical sensors

Research Guidance

No. of Ph.D. Students Completed: **02**; Working **(06)**

No. of Post-Doctoral Fellow (PDF) Completed: **01**; Working **(01)**

MSc Dissertation Competed >**35**; Working **(02)**

Research Highlights

- **Research Experience: 18 years**
- Total Number of Publications: **> 90**
- Average Publications per year (2019 onwards): **12 per year**
- Citations: **1219**
- h-index: **22**
- i10-index: **39**
- Total Impact factor: **309**
- Average Impact factor: **4**

Fellowships/Awards

- Listed in the TOP 2% of all the Scientists in The World according to publication and citation records established by the Stanford University in partnership with Elsevier database using Scopus data (2022).
- GUJARAT SCIENCE ACADEMY (GSA) – Dr. A. K. Shah Best Research Paper Award in Sciences – 2020
- INSA Visiting Scientist -2019 for 1 month: CSIR Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar, Gujarat, India.
- VISITING FELLOWSHIP PROGRAM 2017-2018, for 2 Months: New Chemistry Unit, JNCASR, Bangalore

Publications

1. Krishna H. Modi , Pratik M. Pataniya , Sohel Siraj , Parikshit Sahatiya, Vikas Patel , **C. K. Sumesh** "Synergistic effect from Ni2+ ions with SnS for all solid-state type symmetric supercapacitor, Journal of Energy Storage 63 **(2023)** 107040 **), IF=8.907**
2. Meswa Patel, Kinjal K. JoshiKrishna H. ModiPratik M. PataniyaSohel SirajParikshit Sahatiya, **C.K. Sumesh**, "CuS nanoparticles: An Efficient Electrocatalyst for Hydrogen Evolution Reaction in a wide pH range" Electrochimica Acta, 141740 https://doi.org/10.1016/j.electacta.2022.141740 **(2023), IF=7.336**
3. Kinjal K.Joshi, Pratik M.Pataniya, GopalaBhadu, **C.K.Sumesh,** "Monometallic, bimetallic, and trimetallic chalcogenide-based electrodes for electrocatalytic hydrogen

evolution reaction" International Journal of Hydrogen Energy, https://doi.org/10.1016/j.ijhydene.2022.11.088 **(2023), IF=7.139**

4. Krishna H.Modi, Pratik M.Pataniya, Ayushi Shah, Mohammad Balal, S.R.Barman, **C.K.Sumesh,** "Alloy engineering in InxSn1-xS for enhanced photodetection application" Optical Materials, Volume 134, Part A, 113154 **(2022), IF=3.754**
5. Rahul P Patel, Krishna H. Modi, Pratik M.Pataniya, KK Joshi, Parikshit Sahatiya, **C.K.Sumesh,**"Hand-Print Method for Preparation of Large Area and Binder Free Electrodes for Photodetection and Electrocatalytic Hydrogen Evolution" Solar Energy Volume 246, 1 November 2022, Pages 343-354 **(2022); IF=7.188**
6. NA Trivedi, M Patel, PM Pataniya, **C.K Sumesh** "Large area and robust NiS/Ag electrodes for hydrogen evolution reaction"Materials Today: Proceedings, https://doi.org/10.1016/j.matpr.2022.10.289 **(2022); IF=0.355 (SJR)**
7. RP Patel, PM Pataniya, M Patel, KH Modi, **C.K Sumesh** "Flexible, robust and temperature resistive NIR photodetector based on P-WSe2/P-CuO hybrid on cellulose paper" Materials Today: Proceedings, https://doi.org/10.1016/j.matpr.2022.10.296 **(2022); IF=0.355(SJR)**
8. Pratik M.Pataniya,Vikas Patel, Parikshit Sahatiya, Dattatray Late, **C.K.Sumesh**, "Hydrogen Evolution Reaction in Acidic and Basic Medium on Robust Cobalt Sulphide Electrocatalyst" Surfaces and Interfaces Volume 34, November, 102319, **(2022)**, https://doi.org/10.1016/j.surfin.2022.102319; **IF=6.137**
9. Pratik M Pataniya, Shweta Dabhi, Vikas Patel, **C.K. Sumesh** "Liquid phase exfoliated ReS2 nanocrystals on Paper based Electrodes for Hydrogen Evolution and Supercapacitor Applications" Surfaces and Interfaces, Volume 34, November, 102318, **(2022)**, 102318 https://doi.org/10.1016/j.surfin.2022.102318; **IF=6.137**
10. Payal Chauhan, Alkesh B Patel, GK Solanki, **C.K.Sumesh**, Saurabh S Soni, Dattatray J Late, Vikas Patel, VM Pathak, "Engineered interfaces of WSe2/rhenium doped $SnSe_2$ heterostructures nanosheet arrays for superior hydrogen generation and flexible supercapacitor" Materials Today Chemistry, Volume 26, December **(2022)**, 101079 ;**IF=7.613**
11. Krishna H. Modi, Pratik M. Pataniya, , Vikas Patel, **C.K. Sumesh**"Self-powered photodetector functionalized by SnS quantum dots" Optical Materials 129 **(2022)** 112504; **IF=3.080**
12. Sanni Kapatel, **C.K. Sumesh** " Atomically thin WSe_2 nanosheets for fabrication of high-performance p-Si/WSe2 heterostructure" Optical Materials 129 **(2022),** 112537; **IF=3.754**
13. Meswa Patel, Pratik M. Pataniya, **C.K. Sumesh** "ZnO-WS_2 Nano-heterojunction/ITO photodetector for detection of visible light"**(2022),** Materials Science in Semiconductor Processing 148, 106778; **IF=3.97**
14. Meswa Patel, Pratik M. Pataniya,Vikas Patel,**C. K. Sumesh**"Flexible photodetector based on Graphite/ZnO–WS2 nanohybrids on paper" **(2022)** J Mater Sci: Mater Electron, https://doi.org/10.1007/s10854-022-08309-3 ;**IF=2.478**
15. Pratik M. Pataniya, Xianguang Yang, Baojun Li, Drishya Kannichankandy, **C.K.Sumesh**, Enhanced "Electrocatalysis of WSe_2 Nanosheets by Partial Oxidation for Hydrogen Generation" , International Journal of Energy research, Volume46, Issue9, Pages 12073-12081 DOI: https://doi.org/10.1002/er.7971 **(2022)** ; **IF=5.164**
16. KK Joshi, PM Pataniya, V Patel, **C.K.Sumesh,** "Large-area binder free synthesis of Cu2CoSnS4 on Ag-substrate for electrocatalytic hydrogen evolution" Surfaces and Interfaces 29, 101807 **(2022); IF=6.137**
17. PM Pataniya, **C.K.Sumesh**, "MoS2 Nanosheets on Cu-foil for Rapid Electrocatalytic Hydrogen Evolution Reaction" Journal of Electroanalytical Chemistry, 912 **(2022)** 116270; **IF=4.464**

18. PM Pataniya, BM Soni, GK Solanki, V Patel, **C.K.Sumesh**, "Photodetector based on liquid phase exfoliated SnSe quantum dots" Optical Materials 125, **(2022)** 112110; **IF=3.08**
19. SU Gupta, AG Dalvaniya, C Limberkar, KD Patel, GK Solanki, VM Pathak, Pratik M Pataniya, **C.K.Sumesh**, Narayan N Som, Prafulla K Jha, Vikash Patel, "Annealing induced phase transformation from amorphous to polycrystalline SnSe2 thin film photo detector with enhanced light-matter interaction": Journal of Non-Crystalline Solids 578, **(2022)** 121353 **IF=3.531**
20. Alkesh B Patel, Jayraj V Vaghasiya, Payal Chauhan, **C.K.Sumesh**, Vikas Patel, Saurabh Sureshchandra Soni, Kirit Patel, Parveen Garg, Gunvant K Solanki, VM Pathak, "Synergistic 2D MoSe2@ WSe2 Nanohybrid Heterostructure towards Superior Hydrogen Evolution and Flexible Supercapacitor", **(2022)** Nanoscale, 2022,14, 6636-6647. **IF=7.79**
21. M Patel, PM Pataniya, **C.K.Sumesh,** "Enhanced photoresponse by plasmon resonance in Ni-WS2/Si photodiode" Materials Research Bulletin 145 **(2022)** 111518 **IF=4.641**
22. PM Pataniya, **C.K.Sumesh**, Enhanced electrocatalytic hydrogen evolution reaction by injection of photogenerated electrons in Ag/WS2 nanohybrids: Applied Surface Science 563, **(2021)** 150323 **IF=7.392**
23. PM Pataniya, M Patel, DN Srivastava, **C.K.Sumesh**, "Photosensitive electrocatalysts based on Ni–WS2 nanohybrids for hydrogen evolution reaction: Nanotechnology" 32 **(2021),** 505407 **IF=3.953**
24. RP Patel, PM Pataniya, M Patel, **C.K.Sumesh**, WSe2 crystals on paper: flexible, large area and broadband photodetectors: Nanotechnology 32 **(2021),** 505202 **IF=3.874**
25. PM Pataniya, V Patel, **C.K.Sumesh**, Electrophoretic Deposition of MoSe2–MoOx Nanosheets for Enhanced Electrocatalytic Hydrogen Evolution Reaction: ACS Applied Energy Materials 4 **(2021)**, 7891-7899 **IF**=**6.959**
26. Payal Chauhan, Alkesh B Patel, GK Solanki, Hiren K Machhi, **C.K.Sumesh,** Saurabh S Soni, Vikas Patel, VM Pathak, Ultrasonically Exfoliated Nanocrystal-Based Z-Scheme SnSe2/WSe2 Heterojunction for a Superior Electrochemical Photoresponse:: The Journal of Physical Chemistry C, 125 **(2021)**, 14729-14740 **IF**=**4.126**
27. Pratik M. Pataniya, **C. K. Sumesh**, "Paper-Based Flexible and Photosensitive Electrodes for Hydrogen Evolution Reaction" ACS Applied Energy Materials 4 **(2021)**, 4815-4822 **IF**=**6.959**
28. P Chauhan, AB Patel, S Narayan, J Prasad, **C.K.Sumesh**, GK Solanki, KD Patel, Saurabh S Soni, PK Jha, VM Pathak, Vikas Patel, "Superior electrochemical activity of CdSe thin film by chromium substitutional doping", Journal of Alloys and Compounds 862, **(2021)** 158016 **IF**=**5.316**
29. PM Pataniya, V Patel, **C.K.Sumesh,"**MoS2/WSe2 nanohybrids for flexible paper-based photodetectors", Nanotechnology 32 **(2021)**, 315709 **IF**=**3.874**
30. Drishya Kannichankandy, Pratik M. Pataniya, **C. K. Sumesh**, Vivek M. Pathak, Gunvant K. Solanki, "PANI-WSe2 Nanosheets Hybrid Structure as Efficient Electrocatalysts For Hydrogen Evolution Reaction", Journal of Alloys and Compounds 876 160179, Elsevier **(2021) IF**=**6.371**
31. Pratik M. Pataniya, Dattatray Late, and **C.K. Sumesh**, "Photosensitive WS2/ZnO Nano-Heterostructure-Based Electrocatalysts for Hydrogen Evolution Reaction", ACS Appl. Energy Mater. 2021, 4, 1, 755–762 **(2021) IF**=**6.024**
32. Krishna H. Modi, Pratik M. Pataniya, Vikas Patel, **C.K. Sumesh** "Microwave assisted synthesis of SnS nanosheets for fabrication of large area SnS/Si heterojunction" Solar Energy 221 **(2021)** 412–417 **IF=7.188**
33. Drishya Kannichankandy, Pratik M. Pataniya Som Narayan, Vikas Patel, **C.K. Sumesh**,

Kireet D. Patel, Gunvant K. Solanki, Vivek M. Pathak, Synthetic Metals, 273 **(2021)** 116697. **IF=4**

34. Payal Chauhana, Alkesh B. Patel, G.K. Solankia, K.D. Patel, V.M. Pathak, **C.K. Sumesh**, Som Narayan, Prafulla K. Jha "Rhenium substitutional doping for enhanced photoresponse of n-SnSe2/p-Si heterojunction based tunable and high-performance visible-light photodetector" Applied Surface Science 536 147739 **(2021)**. **IF=7.392**
35. Meswa Patel, Pratik M. Pataniyaa, Dattatray J. Late, **C.K. Sumesh** "Plasmon-enhanced photoresponse in Ag-WS2/Si heterojunction" Applied Surface Science 538 148121 **(2021) IF=7.39**2
36. Pratik M. Pataniya , Sanjay A. Bhakhar, Mohit Tannarana , Chetan Zankat , Vikas Patel , G.K. Solanki,K.D. Patel, Prafulla K. Jha, Dattatray J. Late, **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. **IF=8.128**
37. Prashant R. Ghediya , Yash M. Palan , Drashti P. Bhangadiya , Ishrat I. Nakani, Tapas K. Chaudhuri , Kinjal Joshi, **C.K. Sumesh**, Jaymin Ray "Electrical properties of Ag/p-Cu2NiSnS4 thin film Schottky diode" Materials Today Communications 28 **(2021)** 102697 **IF=3.383**
38. Pratik M Pataniya, **C K Sumesh** "Liquid phase exfoliated MoS_2 nanosheets for electrochemical hydrogen evolution reaction" CHARUSAT Journal **(2021) IF=NA**
39. Krishna.H.Modi , Meswa Patel, **C K Sumesh** "High yield synthesis of SnS for large area paper-based photodetector" CHARUSAT Journal **(2021) IF=NA**
40. Meswa Patel, Pratik M Pataniya, **C K Sumesh** " Large area photodetector based on $MoSe_2$ nanosheets for detection of Visible light" CHARUSAT Journal **(2021) IF=NA**
41. Vidhi K. Bhatt, Meswa Patel, Pratik M. Pataniya, Bragadish D. Iyer, **C. K. Sumesh**, Dattatray J. Late "Enhanced Antiungal Activity of WS2/ZnO Nanohybrid against Candida albicans" ACS Biomater. Sci. Eng. **(2020)**, 6, 11, 6069–6075 **IF=5.395**
42. Pratik M Pataniya, **C K Sumesh**, Mohit Tannarana, Chetan K Zankat,G K Solanki, K D Patel and V M Pathak "Flexible paper based piezo-resistive sensor functionalized by 2D-WSe2 nanosheets" Nanotechnology 31 435503 (9pp) **(2020) IF=3.953**
43. Meswa Patel, Pratik M. Pataniya, Vikas Patel, **C.K. Sumesh**, Dattatray J. Late "Large area, broadband and highly sensitive photodetector based on ZnOWS2/Si heterojunction" Solar Energy 206 974–982 **(2020). IF=5.742**
44. Chetan K. Zankat ,Pratik M. Pataniya , Abhishek Patel, Sanjay A. Bhakhar , Som Narayan, G.K. Solanki, K.D. Patel, V.M. Pathak, **C.K. Sumesh**, P.K. Jha "Self-powered photodetector based on SnSe2/MoSe2 heterostructure" Materials Today Energy 18 **(2020)** 100550 . **IF=7.311**
45. Pratik M. Pataniya and **C.K. Sumesh** "WS2 Nanosheet/Graphene Heterostructures for Paper-Based Flexible Photodetectors"; ACS Appl. Nano Mater. 2020, 3, 7, 6935–6944 **(2020) IF=6.140.**
46. Meswa Patel , Mitesh H. Patel , **C.K.Sumesh** "Visible light enhanced photocatalytic performance of WS2 catalyst for the degradation of ternary dye mixture" AIP Conference Proceedings 2220, 020047 **(2020)**. **SJR=0.33**
47. Pratik M. Pataniya, **C.K. Sumesh** "Low cost and flexible photodetector based on WSe2 Nanosheets/Graphite heterostructure" Synthetic Metals 265 116400 **(2020)**. **IF=4**
48. Alkesh B. Patel1, Payal Chauhan, Kunjal Patel, **C. K. Sumesh**, Som Narayan, K. D. Patel, G. K. Solanki, V. M. Pathak, P. K. Jha, Vikas Patel "Solution-Processed Uniform MoSe2-WSe2 Heterojunction Thin Film on Silicon Substrate for Superior and Tunable Photodetection" ACS Sustainable Chemistry & Engineering 8, 12, 4809-4817 **(2020)**. **IF=9.224**

49. Alkesh B. Patel, Payal Chauhan, Hiren K. Machhi, Som Narayan, **C.K. Sumesh**, K.D. Patel, Saurabh S. Soni, P.K. Jha,G.K. Solanki, V.M. Pathak"Transferrable thin film of ultrasonically exfoliated MoSe2 nanocrystals for efficient visible-light photodetector" Physica E 119 114019 **(2020)**. **IF=3.382**
50. **C. K. Sumesh** "Zinc oxide functionalized molybdenum disulfide heterostructures as efficient electrocatalysts for hydrogen evolution reaction" International Journal of Hydrogen Energy 45 619-628 **(2020)**. **IF=5.816**
51. Meswa Patel, Pratik Pataniya, Hitesh Vala, **C. K. Sumesh** "OneDimensional/Two-Dimensional/Three-Dimensional Dual Heterostructure Based on MoS2-Modified ZnO-Heterojunction Diode with Silicon" J. Phys. Chem. C 123, 36, 21941-21949 **(2019). IF=4.126**
52. **C. K. Sumesh** "Temperature dependant electronic charge transport characteristics at MX_2 (M = Mo, W; X = S, Se)/Si heterojunction devices" Journal of Materials Science: Materials in Electronics; doi.org/10.1007/s10854-019-00703-8 **(2019). IF=2.478**
53. **C. K. Sumesh** "Towards efficient photon management in nanostructured solar cells: Role of 2D layered transition metal dichalcogenide semiconductors" Solar Energy Materials and Solar Cells 192 16–23 **(2019)**. **IF=7.267**
54. **C. K. Sumesh** and Sebastian C. Peter "Two-Dimensional Semiconductor Transition Metal Based Chalcogenide Based Heterostructures for Water Splitting Applications" Dalton Trans., 2019, 48, 12772–12802 **(2019). IF=4.39**
55. **C. K. Sumesh** and Kinnari Parekh "Nano catalytic Physico-chemical adsorption and degradation of organic dyes" Pramana – Journal of Physics (2019) 92:87 DOI:10.1007/s12043-019-1760-0 **(2019). IF= 1.509**
56. Vijay Dixit, Salil Nair, Jolly Joy, C.U. Vyas , Alkesh B. Patel, Payal Chauhan, **C.K. Sumesh**,Som Narayan, P.K. Jha, G.K. Solanki, K.D. Patel, and V.M. Pathak "Growth and application of WSe2 single crystal synthesized by DVT in thin fillm hetero-junction photodetector" Eur. Phys. J. B 92: 118 **(2019)**. **IF=1.5**
57. Pratik Pataniya, Chetan K. Zankat, MohitTannarana, **C. K. Sumesh**, Som Narayan, G. K. Solanki, K. D. Patel, V. M. Pathak, Prafulla K. Jha "Paper Based Flexible Photodetector Functionalized by WSe2 Nanodots" ACS Appl. Nano Mater.2,5, 2758-2766 **(2019). IF=6.140**
58. Abhishek Patel, Pratik Pataniya, G.K. Solanki, **C.K. Sumesh**, K.D. Patel, V.M. Pathak "Fabrication, photoresponse and temperature dependence of n-VO2/nMoSe2 heterojunction diode" Superlattices and Microstructures 130, 160-167 **(2019). IF=2.658**
59. Sanni Kapatel, **C. K. Sumesh** "Two Step Facile Preparation of MoS2·ZnO Nanocomposite as Efficient Photocatalyst for Methylene Blue (Dye) Degradation" Electronic Materials Letters volume 15, pages119–132 (2019). **IF=3.017**
60. Abey M Abraham, Jaimini V Patel, **C K Sumesh "**A facile synthesis of Iron Sulfide thin films by Chemical Bath Deposition Method" CHARUSAT Journal **(2019) IF=NA**
61. Pratik Pataniya, G. K. Solanki, Chetan K. Zankat, Mohit Tannarana, **C. K. Sumesh,** K. D. Patel, V. M. Pathak "Fabrication and photoresponse of n-WS2/p-V0.25W0.75Se2 Van der Waals hetero junction" Pramana – Journal of Physics, 91:41 **(2018). IF=1.509**
62. Abhishek Patel, Pratik Pataniya, Som Narayan**, C.K. Sumesh**, V.M. Pathak, G.K. Solanki, K.D. Patel, Prafulla K. Jha "Investigation of structural, electrical and optical properties of SbXW1-XSe2 single crystals" Materials Science in Semiconductor Processing, 81 108–112 **(2018)**. **IF=3.927**
63. **C. K. Sumesh**, Sanni Kapatel, and Arti Chaudhari "An approach for scalable production of silver (Ag) decorated WS2 nanosheets"AIP Conference Proceedings, 1961 030003 **(2018).**
64. Salil Nair, Jolly Joy, K. D. Patel, Pratik Pataniya, G. K. Solanki, V. M. Pathak, and **C. K.**

Sumesh "Effect of doping on all TMC vertical heterointerfaces" AIP Conference Proceedings 1961, 030008 **(2018)**

65. Sanni Kapatel, Alkesh Patel, **C K Sumesh** "Prospects for Electrochemical and Energy Applications of Highly Stable 2D WS_2 Nanosheets" CHARUSAT Journal Vol-1 **(2017)**
66. Pratik Pataniya, G K Solanki, K D Patel, V M Pathak and **C K Sumesh** "Crystal growth, characterization and photo detection properties of 2H–V0.75W0.25Se2 ternary alloy with 1T–VSe2 secondary phase" Mater. Research Express 4 106306 **(2017) IF=1.609**
67. Sanni Kapatel, Chandresh Mania**, C. K. Sumesh** "Salt assisted sonochemical exfoliation and synthesis of highly stable few-to-monolayer WS2 quantum dots with tunable optical properties" J Mater Sci: Mater Electron,Springer 28 7184 **(2017) IF=2.478**
68. Sanni Kapatel, **C.K. Sumesh**, Pratik Pataniya, G.K. Solanki, and K.D. Patel "Layer-engineered I-V characteristics of p-Si/WS_2 Van der Waals Heterostructure diode Eur. Phys. J. Plus 132 191 **(2017)**. **IF=3.911**
69. G.K. Solanki, Pratik Pataniya, **C.K. Sumesh**, K.D.Patel, V.M. Pathak "Excitonic emission and absorption resonances in V0.25W0.75Se2 single crystals grown by direct vapour transport technique" Journal of Crystal Growth, 441 101-106 (2016) http://dx.doi.org/10.1016/j.jcrysgro.2016.02.018 **(2016)**. **IF=1.797**
70. Sanni Kapatel and ***C. K. Sumesh*** "One Pot Sono-Chemical Synthesis of 2D Layered MoS_2 Nanosheets" AIP Conference proceedings, 1728, 020131,2016. doi: 10.1063/1.4946182 **SJR=0.33**
71. **C. K. Sumesh**, Bhavin Patel and Kinnari Parekh "UV Light Induced Photodegradation of Organic Dye by ZnO Nanocatalysts" AIP Conf. Proc. 1536, 123 **(2013)**. **SJR=0.33**
72. **C. K. Sumesh** and K.D. Patel "Analysis of barrier height inhomogeneities in Al-pSnSe Schottky diode" Eur. Phys. J. Appl. Phys. 59 10103 (2012). **IF=0.993**
73. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Barrier height inhomogeneities in Cu-n$MoSe_2$ Schottky diode" Eur. Phys. J. Appl. Phys. 56 10103 **(2011) IF=0.993**
74. Achamma John Mathai, **C K Sumesh,** B P Modi "Schottky Barriers on Layered Anisotropic Semiconductor – WSe_2 – with 1000 Å Indium Metal Thickness" Materials Sciences and Application **2** 1000 **(2011)**. **IF=3.601**
75. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Metal-semiconductor field-effect transistors fabricated using DVT grown n-MoSe2 crystals with Cu-schottky gates" J. Nano- Electron. Phys. 3 709 **(2011)**. **IF=0.72**
76. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Current transport in Copper Schottky contacts to a-plane/c-plane n-type $MoSe_2$" Chin. Phys. Lett. 28 087201 **(2011)**. **IF=1.483**
77. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Low temperature Hall effect studies of InSb thin films grown by flash evaporation" Eur. Phys. J. Appl. Phys. 54 10303 **(2011)**. **IF=0.993**
78. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Analysis of current - voltage - temperature characteristics of In and Cu contacts on n-type $MoSe_2$ single crystals" Cryst. Res. Technol. 46 61 – 64 **(2011). IF=1.649**
79. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Low Temperature Electrical Transport Properties in p-SnSe Single Crystals" Eur. Phys. J. Appl. Phys. 53 10302 **(2011). IF=0.993**
80. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Current transport Characteristics of pSe-n$MoSe_2$ Heterojunction Diode" Eur. Phys. J. Appl. Phys. 52 30302 **(2010)**. **IF=0.993**
81. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Specific contact resistance at In-n$MoSe_2$ Interfaces" Journal of Electron Devices: Solid State Devices 8 324-329 **(2010).**

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82. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Investigation of carrier scattering mechanisms in molybdenum diselenide single crystals by hall effect measurements" Cryst. Res. Technol. 45 957 – 960 **(2010). IF=1.649**
83. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "A comparative study on stability of Ohmic contacts to molybdenum diselenide semiconductors" International Journal of Advanced Engineering Technology, IJAET I, 37-45 **(2010)**. **IF=3.43**
84. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Native defects in $MoSe_2$ crystals grown by direct vapor transport" PRAJNA - Journal of Pure and Applied Sciences 18 129 - 131 **(2010).**
85. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Current transport mechanisms studied by I-V-T measurement on Cu-n$MoSe_2$ Schottky diode" Journal of Optoelectronics and Advanced Materials, 11 1718 – 1722 **(2009). IF=0.578**
86. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Growth, physical, structural and chemical characterization of layered semiconductor molybdenum diselenide" Journal of Ovonic Research 4 61 – 68 **(2008). IF=0.687**
87. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "Twofold conduction mechanisms in molybdenum diselenide Single crystals in the wide temperature Range of 300k to 12k" Chalcogenide Letters 5 177-180 **(2008). IF=0.885**
88. **C. K. Sumesh**, K.D. Patel, V.M. Pathak and R.Srivasthava "An insight to improved van der Pauw factor and their stability in the temperature range 300K-10K of layered semiconducting material, molybdenum diselenide single crystals." Chalcogenide Letters 5 303-308 **(2008)**. **IF=0.885**
89. **C. K. Sumesh**, Achamma John Mathai, K.D. Patel, V.M. Pathak and R.Srivasthava "Low temperature transport properties of n-WSe_2 single crystals" 'PRAJNA - Journal of Pure and Applied Sciences 16 101-109 **(2008)**.

Patents

(1) Title: Conductive Composition
App. No: 202121054204
Date of Filing: 2021/11/24
Inventors: 1) Bragadish Iyer; 2) C.K.Sumesh; 3) Komal Parmar 4) Pratik Pataniya

(2) Title: Electrode
App. No: 202221013329
Date of Filing: 2021/11/03
Inventors: 1) **C K Sumesh**; 2) Kinjal Joshi; 3) Pratik Pataniya

No. of Projects ongoing/completed as Principal Investigator /Co-PI

1. UGC DAE Consortium for Scientific Research, Indore
   Developing ultrafast, large area and flexible broadband photodetectors based on metal doped SnX (X = S, Se, Te) 2D Nano-heterostructures.
   Role: Principal Investigator
   Duration: March,2022 to March,2025
2. Gujarat State Biotechnology Mission, GSBTM, DST

Exopolysaccharide-based biocomposites as specialty adhesives and binders for electronics application.

Role: Co-Principal Investigator

Duration: October,2022 to October,202

3. CHARUSAT University

Two-dimensional Transition metal monochalcogenides for photo- and electrocatalytic hydrogen evolution applications**.**

Role: Principal Investigator

Duration: March,2019 to March,2022

4. Gujarat State Biotechnology Mission, GSBTM, DST

Role: Principal Investigator

Duration: May,2023 to May,2025

Wastewater remediation through electrochemical anodic oxidation using LDH-MXene composites.

Role: Principal Investigator

Research Collaborations

- IIT Gandhinagar: Dr. Jhuma Saha, Electrical Engineering, IIT Gandhinagar
- BITS Pilani Hyderabad Campus: Dr. Parikshit Sahatiya, Department of Electrical and Electronics Engineering, BITS Pilani – Hyderabad Campus
- CSMCRI- Bhavnagar: Dr. Divesh N. Srivastava, Senior Principal Scientist, CSIR-Central Salt & Marine Chemicals Research Institute, Bhavnagar
- Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, Dr. Sebastian Peter, Associate Professor, JNCASR, Bangalore
- UGC DAE Consortium for Scientific Research, Indore: Dr. Vasant Sathe, Centre Director
- Amity University, Mumbai: Dr. D J Late, Head, Nanoscience Division.
- MS University, Baroda: Dr. P K Jha, Head Department of Physics

Reviewer and Editor

- Reviewer and Editor in the Scopus/Web of Science indexed journal: Reviewer of various reputed journals of Elsevier, Springer, ACS, Wiley, Taylor & Francis, Frontiers in Materials etc
- Editor: Guest Editor in Frontiers in Materials - Semiconducting Materials and Devices

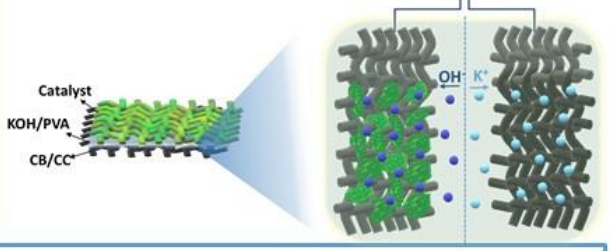
5.

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
Accredited with "Grade A+" by NAAC
Center of Excellence, GoG

Functional Nanomaterials for Energy Harvesting and Storage

Research Interests:

- Electrochemical water splitting: Industrial Scale and energy-saving green H_2 Production
- Energy storage devices: Supercapacitor, battery
- Eco-friendly paper electronics
- Electrochemical sensors
- Flexible and wearable nanoelectronics
- Light harvesting devices: Broad-band and self-powered photodetectors
- Advanced oxidation approaches: Wastewater remediation



Synthesis Techniques:

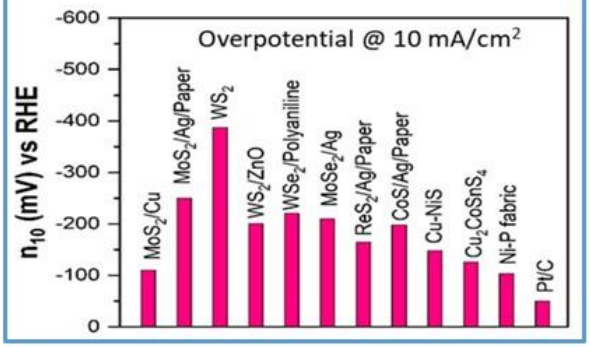
- Hydrothermal technique
- Co-precipitation technique
- Electrophoresis
- Electrochemical synthesis
- Electroless plating
- RF sputtering
- CVD

Nanomaterials:

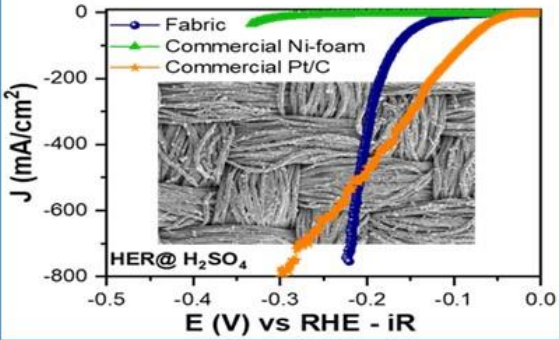
- 2D-Transition metal chalcogenides/phosphides
- Mxenes/heterostructure
- Metal-organic frameworks (MOFs)
- Metal oxides/hydroxides
- Layered double hydroxides (LDHs)
- Heterostructure/ nanohybrid composites

Green hydrogen (H_2) generation

State-of-art electrodes



Pt-scalable catalyst



Research Group:

Dr. C. K. Sumesh (PI)
Dr. Pratik Pataniya (PI)
Dr.Sanni Kaptel (PI)
Dr.Shweta Dabhi (PI)
Dr.Payal Chauhan (Post Doc.), Ms.Krishna Modi (Ph.D.), Ms.Kinjal Joshi (Ph.D.), Mr.Rahul Patel (Ph.D.), Mr.Harsh Thakker (Ph.D.), Ms.Ayushi Shah (Ph.D.), Ms.Pooja Sharma (Ph.D.), Ms.Nandini Trivedi(Ph.D.),Ms.Simmy Joseph(PhD), Mr.Shobhraj Rathod (PhD)

Scope for the collaboration:

- Bio-Sensors
- Electrochemical batteries (Na-ion, Zn-ion batteries)
- Fuel cell for green energy generation from H_2

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