Vijay Shamrao Kumbhar

CSIR's Senior Research Associate (Scientist Pool Scheme)
Department of Physics, Shivaji University, Kolhapur, India
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EDUCATION:

- **Ph.D. (July 2012-Dec. 2015):** "Synthesis, characterization and supercapacitive properties of chemically deposited samarium chalcogenide thin films": Shivaji University Kolhapur.
- **M.Sc. (June 2004-April 2006) Physics (First Class):** Shivaji University Kolhapur.
- **B.Sc. (June 2001-April 2004) Physics (First Class):** Shivaji University Kolhapur.

SCIENTIFIC SKILLS

- **Material synthesis:** Solid State and Wet Chemical methods
- **Spectroscopic analysis:** Powder XRD (Reitveld Refinements), XPS, Cyclic Voltammetry, Impedance Spectroscopy
- **Device fabrication and performance analysis:** Symmetric and Asymmetric supercapacitors, Flexible Supercapacitors
- **Scientific writing:** Research proposal and article
- **Softwares:** Origin, EndNote, Microsoft Office

PROFESSIONAL EXPERIENCE

- **JSPS Postdoctoral Fellow:** (November 2019-April 2021): Yamaguchi University, Ube, Japan.
  -Core-shell design of the several nanostructured novel materials for energy related applications.
  -Scientific data collection by spectroscopic techniques and data analysis
- **Post-Doctoral Fellow:** (August 2018-September 2019) Kyungpook National University, Sangju, South Korea.
  -Core-shell design of the several nanostructured novel materials for energy related applications.
  -Scientific data collection by spectroscopic techniques and data analysis
- **Post-Doctoral Fellow:** (April 2017-Present): Chonnam National University, Gwangju South Korea.
  -Core-shell design of the several nanostructured novel materials for energy storage applications.
  -Scientific data collection by spectroscopic techniques and data analysis
- **Post-Doctoral Fellow** (March 2016-Feb. 2017): Yeungnam University, Gyeongsan, South Korea.
  - Preparation of novel nanostructures of MnS, NiO, and $NiMoO_4$ for supercapacitor application
  - Scientific data collection by spectroscopic techniques and data analysis
- **Senior Research Fellow** (Oct. 2014-Dec. 2015): Shivaji University, Kolhapur, India.
  -Wet chemical synthesis of samarium chalcogenide thin films for supercapacitor application.
  -Device fabrication and performance evaluation
  -Scientific data collection by spectroscopic techniques and data analysis.
- **Senior Research Fellow** (Aug. 2010- Aug. 2011): IGCAR, Kalpakkam, India
  -Solid state synthesis of inorganics materials for structural analysis
- **Junior Research Fellow** (Aug. 2008-Aug. 2010): IGCAR, Kalpakkam, India
  -Solid state synthesis of inorganics materials for structural analysis
- **Clock Hour Basis Lecturer** (Jan. 2014- April 2014): Shahu College, Kolhapur, India
  -Lectures and laboratory practicals to undergraduate students
- **Clock Hour Basis Lecturer** (Aug. 2013- April 2014): Rajaram College, Kolhapur, India
  -Lectures and laboratory practicals to undergraduate students
- **Clock Hour Basis Lecturer** (Aug. 2012- April 2013): Rajaram College, Kolhapur, India
  -Lectures and laboratory practicals to undergraduate students
- **Clock Hour Basis Lecturer** (Aug. 2011- April 2012): Devchand College, Nippani, India
  -Lectures and laboratory practicals to undergraduate students
- **Clock Hour Basis Lecturer** (Aug. 2006- April 2008): Rajaram College, Kolhapur, India
  -Lectures and laboratory practicals to undergraduate students

AWARDS AND HONOURS

- Japan Society for Promotion of Science (JSPS) Postdoctoral Fellowship (Standard)-2019, JSPS, Japan.
- National Postdoctoral Fellowship-2017, SERB, India
- Senior Research Fellowship-2014, CSIR, New Deli, India.
- Senior Research Fellowhip-2010, IGCAR, Kalpakkam, India
- Junior Research Fellowhip-2008, IGCAR, Kalpakkam, India
- National Level Graduate Aptitude Test in Engineering, GATE-2009, 2011.
- Maharashtra State Eligibility Test (MH-SET -2021)

PUBLICATIONS

- **V.S. Kumbhar**, H. Lee, J. Lee, N.R. Chodankar, K. Lee, Mesoporous design of ultrathin NiO nanosheet-coated vertically aligned hexagonal CoS nanoplate core–shell array for flexible all-solid-state supercapacitors, *Journal of Alloys and Compounds* 863 (2021) 158064.
- **V.S. Kumbhar**, W. Lee, K. Lee, Self-assembly of $NiMoO_4$ nanoparticles on the ordered $NiCo_2O_4$ ultra-thin nanoflakes core-shell electrode for high energy density supercapacitors and efficient oxygen evolution reaction, *Ceramics International* 46 (2020) 22837-22845.
- **V.S. Kumbhar**, J. Lee, Y. Choi, H. Lee, M. Ryuichi, M. Nakayama, W. Lee, H. Oh, K. Lee, Electrochromic and pseudocapacitive behavior of hydrothermally grown WO_3 nanostructures, *Thin Solid Films* 709 (2020) 138214.
- **V.S. Kumbhar**, H. Lee, J. Lee, K. Lee, Recent advances in water-splitting electrocatalysts based on manganese oxide, *Carbon Resources Conversion* 2 (2019) 242-255
- **V.S. Kumbhar**, H. Lee, J. Lee, K. Lee, Interfacial growth of the optimal $BiVO_4$ nanoparticles onto self-assembled WO_3 nanoplates for efficient photoelectrochemical water splitting, *Journal of colloid and interface science* 557 (2019) 478-487.
- **V.S. Kumbhar**, N.R. Chodankar, K. Lee, D. H. Kim, Insights into the interfacial nanostructuring of $NiCo_2S_4$ and their electrochemical activity for ultra-high capacity all-solid-state flexible asymmetric supercapacitors *Journal of colloid and interface science* 557 (2019) 423-437.
- **V.S. Kumbhar** Do-Heyoung Kim, Hierarchical coating of MnO_2 nanosheets on $ZnCo_2O_4$ nanoflakes for enhanced electrochemical performance of asymmetric supercapacitors, Electrochimica Acta 271 (2018) 284-296.
- **V.S. Kumbhar**, AC Lokhande, NR Chodankar, NS Gaikwad, CD Lokhande, Self-assembled samarium selenide nanorods as a new electrode material for reliable supercapacitors, Materials Letters, 223 (2018) 45-48
- **V.S. Kumbhar**, M.H. Cho, J. Lee, W.K. Kim, M. Lee, Y.R. Lee, J.J. Shim Electrosynthesis of a corn flake-like NiO nanostructure on nickel foam for polymer gel electrolyte-based high performance asymmetric supercapacitors, *New Journal of Chemistry*, 41 (2017) 10584-10591
- **V.S. Kumbhar,** Y.R. Lee, C.S. Ra, D. Tuma, B.-K. Min, J. J. Shim, Modified chemical synthesis of MnS nanoclusters on nickel foam for high performance all-solid-state asymmetric supercapacitors, *RSC Advances* 7 (2017) 16348-16359.
- **V.S. Kumbhar**, A.C. Lokhande, N.S. Gaikwad, C.D. Lokhande, Synthesis of samarium telluride thin films by successive ionic layer adsorption and reaction (SILAR) method for supercapacitor application, *Materials Science and Semiconductor Processing* 46 (2016) 29-34.
- **V.S. Kumbhar**, A.C. Lokhande, N.S. Gaikwad, C.D. Lokhande, One-step chemical synthesis of samarium telluride thin films and their supercapacitive properties, *Chemical Physics Letters* 645 (2016)112-117.
- **V.S. Kumbhar**, A.C. Lokhande, N.S. Gaikwad, C.D. Lokhande, Porous network of samarium sulfide thin films for supercapacitive application, *Materials Science in Semiconductor Processing* 33 (2015) 136−139.
- **V.S. Kumbhar,** A.C. Lokhande, N.S. Gaikwad, C.D. Lokhande, Facile synthesis of Sm_2S_3 diffused nanoflakes and their pseudocapactive behaviour, *Ceramic International* 41 (2015) 5758−5764.
- **V.S. Kumbhar,** A.D. Jagadale, N.S. Gaikwad, C.D. Lokhande, Modified chemical synthesis of porous α-Sm_2S_3 thin films, *Materials Research Bulletin* 56 (2014) 39−44.
- **V.S. Kumbhar,** A.D. Jagadale, C.D. Lokhande, Supercapacitive evaluation of soft chemically deposited α-Sm_2S_3 thin films, *Journal of Power Sources*, 234 (2013) 107−110.
- **V.S. Kumbhar**, A.D. Jagadale, N.M. Shinde, C.D. Lokhande, Chemical synthesis of spinel cobalt ferrite ($CoFe_2O_4$) nano-flakes for supercapacitor application, *Applied Surface Science* 259 (2012) 39−43.
- E Park, SS Patil, H Lee, **VS Kumbhar**, K Lee, Photoelectrochemical H_2 evolution on WO_3/$BiVO_4$ enabled by single-crystalline TiO_2 overlayer modulations, *Nanoscale* 40 (2021) 16932-16941.

- R.C. Rohit, A.D. Jagadale, S.K. Shinde, D.-Y. Kim, **V.S. Kumbhar**, M. Nakayama, Hierarchical nanosheets of ternary CoNiFe layered double hydroxide for supercapacitors and oxygen evolution reaction, *Journal of Alloys and Compounds* 863 (2021) 158081.
- M. Nakayama, A. Takeda, H. Maruyama, **V.S. Kumbhar**, Olivier Crosnier, Cobalt-substituted iron-based wolframite synthesized via polyol route for efficient oxygen evolution reaction, *Electrochemistry Communications* 120 (2020) 106834.
- Y. Choi, H. Lee, **V.S. Kumbhar**, Y.-W. Choi, J. Kim, K. Lee, Enhancement of photoelectrochemical properties with α–Fe2O3 on surface modified FTO substrates, *Ceramics International* 46 (2020) 20012-20019.
- F. Kataoka, T. Ishida, K. Nagita, **V.S. Kumbhar**, K. Yamabuki, M. Nakayama, Cobalt-Doped Layered MnO2 Thin Film Electrochemically Grown on Nitrogen-Doped Carbon Cloth for Aqueous Zinc-Ion Batteries, *ACS Applied Energy Materials 3* (2020) 4720−4726.
- R.C. Rohit, A. Jenifer, A.D. Jagadale, **V.S. Kumbhar**, H. Lee, K. Lee, Facile synthesis of Ce-doped α-cobalt hydroxide nanoflakes battery type electrode with an enhanced capacitive contribution for asymmetric supercapacitors, *Journal of Energy Storage* 28 (2020) 101227.
- H. Lee, **V.S. Kumbhar**, J. Lee, Y. Choi, K. Lee, Highly reversible crystal transformation of anodized porous V_2O_5 nanostructures for wide potential window high-performance supercapacitors, *Electrochimica Acta* 334 (2020) 135618
- SK Shinde, HM Yadav, GS Ghodake, AA Kadam, **V.S. Kumbhar**, Jiwook Yang, Kyojung Hwang, AD Jagadale, Sunil Kumar, DY Kim, Using chemical bath deposition to create nanosheet-like CuO electrodes for supercapacitor applications, *Colloids and Surfaces B: Biointerfaces* 181 (2019)1004-1011.
- Shengnan Li, Shuang Zhao, Ruimin Xing, **V.S. Kumbhar**, Kiyoung Lee, Yanmei Zhou, Nakata Kazuya, Akira Fujishima, Shanhu Liu, Zn− Co− S colloidal nanocrystal clusters as efficient and durable bifunctional electrocatalysts for full water splitting, *ChemNanoMat* 5 (2019) 761-765
- Jaewon Lee, Seong-Yun Jung, **V.S. Kumbhar**, Sunghyun Uhm, Hyun-Joon Kim, Kiyoung Lee, Formation of aluminum oxide nanostructures via anodization of Al3104 alloy and their wettability behavior for self-cleaning application, *Catalysis Today* 359 (2021) 50-56.
- S. K. Shinde, M. B. Jalak, G. S. Ghodake, N. C. Maile, **V. S. Kumbhar**, D.S. Lee, V. J. Fulari, D.-Y.Kim, Chemically synthesized nanoflakes-like NiCo2S4 electrodes for high-performance supercapacitor application, *Applied Surface Science* 466 (2019) 822-829.
- A.M. Patil, A.C. Lokhande, N.R. Chodankar, **V.S. Kumbhar**, C.D. Lokhande, Engineered morphologies of β-NiS thin films via anionic exchange process and their supercapacitive performance, *Materials & Design* 97 (2016) 407-416.
- A.M. Patil, **V.S. Kumbhar**, N.R. Chodankar, A.C. Lokhande, C.D. Lokhande, Electrochemical behavior of chemically synthesized selenium thin film, Journal of *Colloid and Interface Science* 469 (2016) 257-262.
- R.B. Pujari, V.C. Lokhande, **V.S. Kumbhar**, N.R. Chodankar, C.D. Lokhande Hexagonal Microrods architectured MoO_3 thin film for supercapacitor application, *Journal of Materials Science: Materials in Electronics* 27 (2016) 3312-3317.
- A.A. Jadhav, **V.S. Kumbhar**, S.J. Patil, N.R. Chodankar, C.D. Lokhande, Supercapacitive properties of chemically deposited La_2O_3 thin films *Ceramic International* 42 (2016) 2079-2084.
- N.M. Shinde, A.D. Jagadale, **V.S. Kumbhar**, T.R. Rana, J.H. Kim, C.D. Lokhande, Wet chemical synthesis of WO_3 thin films for supercapacitor applications, *Korean Journal of Chemical Engineering* 32 (2015) 974-979.
- S.J. Patil, **V.S. Kumbhar**, B.H. Patil, R.N. Bulakhe, C.D. Lokhande, Chemical synthesisof α–La_2S_3 thin film as an advanced electrode material for supercapacitor application, *Journal of Alloys and Compounds* 611 (2014) 191−196.
- A.D. Jagadale, **V.S. Kumbhar**, R.N. Bulakhe, C.D. Lokhande, Influence of electrodeposition modes on the supercapacitive performance of Co_3O_4 electrodes, *Energy* 64 (2014) 234−241.
- S.S. Shinde, G.S. Gund, **V.S. Kumbhar**, B.H. Patil, C.D. Lokhande, Novel chemical synthesis of polypyrrole thin film electrodes for supercapacitor application, *European Polymer Journal* 49 (2013) 3734−3739.
- A.D. Jagadale, **V.S. Kumbhar**, C.D. Lokhande, Supercapacitive activities of potentiodynamically deposited nanoflakes of cobalt oxide (Co_3O_4) thin film electrode, *Journal of Colloid and Interface Science* 406 (2013) 225−230.
- A.D. Jagadale, **V.S. Kumbhar**, D.S. Dhawale, C.D. Lokhande, Potentiodynamically deposited nickel oxide (NiO) nanoflakes for pseudocapacitors, *Journal of Electroanalytical Chemistry* 704 (2013) 90−95.
- A.D. Jagadale, **V.S. Kumbhar**, D.S. Dhawale, C.D. Lokhande, Performance evaluation of symmetric supercapacitor based on cobalt hydroxide [$Co(OH)_2$] thin film electrodes, *Electrochimica Acta* 98 (2013) 32−38.
- S.B. Kulkarni, A.D. Jagadale, **V.S. Kumbhar**, R.N. Bulakhe, S.S. Joshi, C.D. Lokhande, Potentiodynamic deposition of composition influenced $Co_{1-x}Ni_x$ LDHs thin film electrode for redox supercapacitors, *International Journal of Hydrogen Energy* 38 (2013) 4046−4053.