

Biodata

Name: Bulusu Venkata Sarada
Designation: Scientist 'E'
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Educational Qualifications:

B.Sc. (Physics), Sri Sathya Sai Institute of Higher Learning,
Prasanthinilayam
M.Sc. (Physics), Sri Venkateswara University, Tirupathi
M. Phil. (Physics) Central University of Hyderabad, Hyderabad
Ph.D.(Applied Chemistry), Faculty of Engineering, The University
of Tokyo, Japan

Professional Experience:

- Lecturer in Physics and Electronics, Osmania University 1993-1997
- Postdoctoral fellow: JSPS Post-doctoral Fellow at Faculty of Engineering, The University of Tokyo during 2000-2002
- JST Post-doctoral Researcher under Pre-venture project at The University of Tokyo, Japan 2002-2003
- Woman Scientist (WOS-A) under DST scheme 2006-2009
- Scientist 'D' Centre for Solar Energy Materials (CSEM), ARCI, Hyderabad 2009-2013
- Scientist 'E' CSEM, ARCI, Hyderabad 2013-present.

Areas of Research Interest:

- CIGS and CZTS based thin-film Solar Cells by using electrodeposition technique.
- Highly textured and twinned copper foils by pulsed electrodeposition
- Electrochemical Synthesis of Nanostructured Materials, Graphene-based Nanocomposites for energy conversion and storage applications
- Synthesis of graphene by electrochemical anodization.
- Electrochemical Synthesis of TiO₂ based Nanostructured materials for photovoltaic and biomedical applications.
- Synthesis and Applications of Conducting boron-doped diamond Thin-films and microelectrodes.
- Non-chrome based Solar selective coatings for CSP applications
- Metal-oxide based nanostructures for Pseudocapacitor applications
- Materials for Biomedical Applications

Guided 2 Ph.D students (IIT-Hyderabad and University of Hyderabad) and Co-guided 2 more Ph. D. students (University of Tokyo),
Guiding 2 Ph. D. Students (NIT-Warangal and IIT-Hyderabad)

Projects:6 M. Tech. students and 5 B. Tech students. 2 M. Sc. Students

List of Publications:

1. **Sarada, BV**; Rao, TN; Tryk, DA; Fujishima, A, "Electrochemical characterization of highly boron-doped diamond microelectrodes in aqueous electrolyte" JOURNAL OF THE ELECTROCHEMICAL SOCIETY, 146 (4): 1469-1471 1999.
2. Fujishima, A; Rao, TN; Popa, E; **Sarada, BV**; Yagi, I; Tryk, DA, "Electroanalysis of dopamine and NADH at conductive diamond electrodes" JOURNAL OF ELECTROANALYTICAL CHEMISTRY, 473 (1-2): 179-185 1999
3. **Sarada, BV**; Rao, TN; Tryk, DA; Fujishima, A, "Electrochemical detection of serotonin using conductive diamond electrodes" CHEMISTRY LETTERS, (11): 1213-1214 1999.
4. **Sarada, BV**; Rao, TN; Tryk, DA; Fujishima, A, "Electroanalytical applications of conductive diamond electrodes" NEW DIAMOND AND FRONTIER CARBON TECHNOLOGY, 9 (5): 365-377 1999
5. **Sarada, BV**; Rao, TN; Tryk, DA; Fujishima, A, "Electrochemical oxidation of histamine and serotonin at highly boron doped diamond electrodes" ANALYTICAL CHEMISTRY, 72 (7): 1632-1638 1 2000
6. Chailapakul, O; Popa, E; Tai, H; **Sarada, BV**; Tryk, DA; Fujishima, A, "The electrooxidation of organic acids at boron-doped diamond electrodes" ELECTROCHEMISTRY COMMUNICATIONS, 2 (6): 422-426 2000
7. Rao, TN; **Sarada, BV**; Tryk, DA; Fujishima, A, "Electroanalytical study of sulfa drugs at diamond electrodes and their determination by HPLC with amperometric detection" JOURNAL OF ELECTROANALYTICAL CHEMISTRY, 491 (1-2): 175-181 2000

8. Spataru, N; **Sarada, BV**; Popa, E; Tryk, DA; Fujishima, A, "Voltammetric determination of L-cysteine at conductive diamond electrodes" ANALYTICAL CHEMISTRY, 73 (3): 514-519 2001
9. Terashima, C; Rao, TN; **Sarada, BV**; Tryk, DA; Fujishima, A, "Electrochemical oxidation of chlorophenols at a boron-doped diamond electrode and their determination by high-performance liquid chromatography with amperometric detection" ANALYTICAL CHEMISTRY, 74 (4): 895-902 2002
10. Rao, TN; Loo, BH; **Sarada, BV**; Terashima, C; Fujishima, A, "Electrochemical detection of carbamate pesticides at conductive diamond electrodes" ANALYTICAL CHEMISTRY, 74 (7): 1578-1583 2002
11. Kondo, T; Einaga, Y; **Sarada, BV**; Rao, TN; Tryk, DA; Fujishima, A, "Homoepitaxial single-crystal boron-doped diamond electrodes for electroanalysis" JOURNAL OF THE ELECTROCHEMICAL SOCIETY, 149 (6): E179-E184 2002
12. Ivandini, TA; **Sarada, BV**; Terashima, C; Rao, TN; Tryk, DA; Ishiguro, H; Kubota, Y; Fujishima, A, "Electrochemical detection of tricyclic antidepressant drugs by HPLC using highly boron-doped diamond electrodes" JOURNAL OF ELECTROANALYTICAL CHEMISTRY, 521 (1-2): 117-126 2002
13. Spataru, N; **Sarada, BV**; Tryk, DA; Fujishima, A, "Anodic voltammetry of xanthine, theophylline, theobromine and caffeine at conductive diamond electrodes and its analytical application" ELECTROANALYSIS, 14 (11): 721-728 2002
14. Chailapakul, O; Siangproh, W; **Sarada, BV**; Terashima, C; Rao, TN; Tryk, DA; Fujishima, A, "The electrochemical oxidation of homocysteine at boron-doped diamond electrodes with application to HPLC amperometric detection" ANALYST, 127 (9): 1164-1168 2002
15. Olivia, H; **Sarada, BV**; Shin, D; Rao, TN; Fujishima, A, "Selective amperometric detection of dopamine using OPPy-modified diamond microsensor system" ANALYST, 127 (12): 1572-1575 2002
16. Shin, DC; **Sarada, BV**; Tryk, DA; Fujishima, A, "Application of diamond microelectrodes for end-column electrochemical detection in capillary

- electrophoresis" ANALYTICAL CHEMISTRY, 75 (3): 530-534 2003
17. Terashima, C; Rao, TN; **Sarada, BV**; Fujishima, A, "Amperometric detection of oxidized and reduced glutathione at anodically pretreated diamond electrodes" CHEMISTRY LETTERS, 32 (2): 136-137 2003
 18. Terashima, C; Rao, TN; **Sarada, BV**; Spataru, N; Fujishima, A, "Electrodeposition of hydrous iridium oxide on conductive diamond electrodes for catalytic sensor applications" JOURNAL OF ELECTROANALYTICAL CHEMISTRY, 544: 65-74 2003
 19. Terashima, C; Rao, TN; **Sarada, BV**; Kubota, Y; Fujishima, A, "Direct electrochemical oxidation of disulfides at anodically pretreated boron-doped diamond electrodes" ANALYTICAL CHEMISTRY, 75 (7): 1564-1572 2003
 20. Rao, TN; Ivandini, TA; Terashima, C; **Sarada, BV**; Fujishima, A, "Applications of bare and modified diamond electrodes in electroanalysis" NEW DIAMOND AND FRONTIER CARBON TECHNOLOGY, 13 (2): 79-88 2003
 21. Ivandini, TA; **Sarada, BV**; Terashima, C; Rao, TN; Tryk, DA; Ishiguro, H; Kubota, Y; Fujishima, A, "Gradient liquid chromatography of leucine-enkephalin peptide and its metabolites with electrochemical detection using highly boron-doped diamond electrode" JOURNAL OF CHROMATOGRAPHY B-ANALYTICAL TECHNOLOGIES IN THE BIOMEDICAL AND LIFE SCIENCES, 791 (1-2): 63-72 2003.
 22. Ivandini, TA; **Sarada, BV**; Rao, TN; Fujishima, A, "Electrochemical oxidation of underivatized-nucleic acids at highly boron-doped diamond electrodes" ANALYST, 128 (7): 924-929 2003
 23. Olivia, H; **Sarada, BV**; Honda, K; Fujishima, A, "Continuous glucose monitoring using enzyme-immobilized platinized diamond microfiber electrodes" ELECTROCHIMICA ACTA, 49 (13): 2069-2076 2004.
 24. Sarada B. V.; Pavithra, CLP; Ramakrishna M.; Rao, TN.; Sundararajan G., "Highly (111) textured copper foils with high hardness and high electrical conductivity by pulse reverse electrodeposition" ELACTROCHEMICAL AND SOLID STATE LETTERS, 13(6): d40-d42 2010.

25. Chakravarty, Dibyendu; Sarada, B. V.; Chandrasekhar, S. B., Saravanan, K., Rao, T. N., A novel method of fabricating porous silicon, MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING , Volume: **528** Issue: **25-26** Pages: **7831-7834** 2011.
26. Sarada B. V, Radha L., Rao T. N., Surface Plasmon Resonance Enhanced Photoelectrochemical Studies at Gold-modified TiO₂ Nanotube Arrays. NANOTECH INSIGHTS, January, 2012
27. **B. V. Sarada**, Ch. L. P. Pavithra, M. Ramakrishna and Tata N. Rao, “Nanostructured copper foils by Pulse Reverse Electrodeposition for Interconnect Applications”, NANOTECH INSIGHTS, Volume 4, Issue 1 Page 2013.
28. Sreekanth Mandati; **Sarada, B V.**; Dey, Suhash R and Shrikant V. Joshi, Pulsed Electrodeposition of CuInSe₂ Thin Films with Morphology for Solar Cell Applications JOURNAL OF THE ELECTROCHEMICAL SOCIETY , Volume: **160** Issue: **4** Pages: **D173-D177** 2013
29. Sreekanth Mandati, **Sarada, B V**, Suhash R. Dey, and Shrikant V. Joshi, Improved photoelectrochemical performance of Cu(In,Ga)Se₂ thin films prepared by pulsed electrodeposition, J. RENEWABLE SUSTAINABLE ENERGY 5, 031602, 2013
30. Sreekanth Mandati, **Sarada, B V**, Suhash R. Dey, Shrikant V. Joshi, Two-step Pulsed Current Electrodeposition of CIGS Absorber Layers for Thin Film Solar Cells, MATERIALS LETTERS,118, 158, 2014.
31. Pavithra Ch.L.P., **Sarada B. V.**, Rajulapati K. V., Rao T. N., Sundararajan G., A New Electrochemical Approach for the Synthesis of Copper-Graphene Nanocomposite Foils with High Hardness, SCIENTIFIC REPORTS/Nature Publishing Group, 4, Article No.4049, 2014.
32. Sreekanth Mandati, **Sarada B. V.**, Suhash R. Dey, Shrikant V. Joshi Photoelectrochemistry of Cu(In,Ga)Se₂ thin-films fabricated by sequential pulsed electrodeposition, JOURNAL OF POWER SOURCES, 273, 149-157 2014.
33. Sreekanth Mandati, **Sarada B V**, Suhash R. Dey, Shrikant V. Joshi Cu(In,Ga)Se₂/CdS heterojunction with enhanced photoelectrochemical performance and stability – ELECTRONIC MATERIALS LETTERS, 11, 618, 2015.
34. Ch. L. P. Pavithra, **B. V. Sarada**, M. Ramakrishna, Tata N. Rao, R. Koteswara Rao, G. Sundararajan, Texture-property correlation in copper foils with enhanced mechanical and electrical properties prepared by pulse reverse electrodeposition, CRYSTAL GROWTH AND DESIGN, 15 (2015) 4448

35. Process Optimization for Pulse Reverse Electrodeposition of Graphene-Reinforced Copper Nanocomposites, *Chokkakula L. P. Pavithra, Bulusu V. Sarada* , Koteswararao V. Rajulapati , Tata N. Rao, G. Sundararajan, *MATERIALS AND MANUFACTURING TECHNOLOGIES* 31 (11) 1439, 2016.
36. Graphene-Modified Electrodeposited Dendritic Porous Tin Structures as Binder Free Anode for High Performance Lithium-Sulfur Batteries, E Hari Mohan; **Sarada B V**; R. Venkata Ram Naidu; Girish Salian; K. Haridas Anulekha; B. V. Appa Rao and T. N. Rao, *ELECTROCHIMICA ACTA*, 219 (2016) 701.
37. Nanomaterials and Coatings for Concentrated Solar Thermal Power (CSP) Applications, S. Sakthivel, **B.V. Sarada** and Tata Narasinga Rao, *NANO DIGEST 8th Anniversary Issue 2016*.
38. Core-shell carbon coating strategy for production of bulk carbon coated-conducting LFP for high energy density LIB applications, P.M. Pratheeksha, E. Hari mohan , **Sarada B V** , M. Ramakrishna; K. Hembram; P.V.V. Srinvas; D. Paul Joseph, S. Anandan, T.N. Rao, *PHYSICAL CHEMISTRY CHEMICAL PHYSICS*, 19, 175, 2017.
38. Nanoclay-based Self-Healing, Corrosion Protection Coatings on Aluminum, A356.0 and AZ91 Substrates, S. Manasa, A. Jyothirmayi, T. Siva, **B. V. Sarada** M. Ramakrishna, S. Sathiyarayanan, K. V. Gobi , R. Subasri, *JOURNAL OF COATINGS TECHNOLOGY AND RESEARCH* 14 (5) 1195-1208, 2017
39. Swapnil H. Adsul, K.R.C. Soma Rajua, **B.V. Sarada** , Shirish H. Sonawanec, R. Subasri, Evaluation of self-healing properties of inhibitor loaded nanoclay-based anticorrosive coatings on magnesium alloy AZ91D, *JOURNAL OF MAGNESIUM ALLOYS AND COMPOUNDS* 6(3) 299-308, 2018
40. DivyaBoosagulla, Sreekanth Mandati, RamachandraiahAllikayala and **Bulusu V. Sarada**, Room Temperature Pulse Electrodeposition of CdS Thin Films for Application in Solar Cells and Photoelectrochemical cells, *ECS JOURNAL OF SOLID STATE SCIENCE AND TECHNOLOGY*, 7(8) P440-P446 2018
41. Sreekanth Mandati, Suhash R. Dey, Shrikant V. Joshi and **Bulusu V. Sarada**, Cu(In,Ga)Se₂ Films with Branched Nanorod Architectures Fabricated by Economic and Environmental-friendly Pulse-reverse Electrodeposition Route, *ACS SUSTAINABLE CHEMISTRY AND ENGINEERING*, 6 (11), 13787-13796, 2018.

42. Copper Chalcopyrites for Solar Energy Applications, Sreekanth Mandati, Prashant Misra, **Bulusu V. Sarada** and Tata Narasinga Rao, TRANSACTIONS OF THE INDIAN INSTITUTE OF METALS, 72, 271, 2019.
43. E. Hari Mohan, Katchala Nanaji, Srinivasan Anandan, **B. V. Sarada**, Mantripragada Ramakrishna, A. Jyothirmayi, B.V. Appa Rao, Tata Narasinga Rao, One-step induced porous graphitic carbon sheets as supercapacitor electrode material with improved rate capability, MATERIALS LETTERS, 236 205–209, 2019.
44. Nanaji Katchala, Hari Mohan E., **Sarada V. Bulusu**, Varadaraju U.V., Tata N. Rao, Anandan Srinivasan, One step synthesized hierarchical spherical porous carbon as an efficient electrode material for lithium ion battery, MATERIALS LETTERS, 237, 156-160, 2019.
45. Sreekanth Mandati, Suhash R. Dey, Shrikant V. Joshi and **B. V. Sarada** Two-dimensional $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$ Nano-flakes by Pulse Electrodeposition for Photovoltaic Applications, , SOLAR ENERGY, 181, 396, 2019.
46. Tejassvi Pakki, Hari Mohan E., Neha Y. Hebalkar, A. Jyothirmayi, **Sarada V. Bulusu**, Srinivasan Anandan, Krishna Mohan Mantravadi, Tata N. Rao, Flexible and freestanding carbon nanofiber matt derived from electrospun polyimide as an effective interlayer for high performance Li-S batteries, JOURNAL OF MATERIALS SCIENCE 54, 9075, 2019.

Conference Proceedings:

47. Fujishima, A; Rao, TN; **Sarada, BV**, Electroanalytical applications of bare and modified diamond electrodes
Conference: 7th International Symposium on Diamond Materials Location: SAN FRANCISCO, CA Date: SEP 07, 2000, DIAMOND MATERIALS VII, PROCEEDINGS Book Series: ELECTROCHEMICAL SOCIETY SERIES Volume: 2002 Issue: 25 Pages: 127, 2001
48. Rao, TN; **Sarada, BV**; Tryk, DA; Fujishima A., Electrochemical oxidation of sulfa drugs at boron-doped diamond electrodes
Conference: 6th International Symposium on Diamond Materials at the 196th Meeting of the Electrochemical-Society Location: HONOLULU, HI Date: OCT 17-22, 1999

Source: DIAMOND MATERIALS VI Book Series: ELECTROCHEMICAL SOCIETY SERIES Volume: 99 Issue: 32 Pages: 507-511 Published: 2000

49. **Sarada, BV**; Rao, TN; Tryk, DA; Fujishima A, Electrochemical oxidation of histamine and serotonin at highly boron-doped diamond electrodes,.
Conference: 6th International Symposium on Diamond Materials at the 196th Meeting of the Electrochemical-Society Location: HONOLULU, HI Date: OCT 17-22, 1999
Source: DIAMOND MATERIALS VI Book Series: ELECTROCHEMICAL SOCIETY SERIES Volume: 99 Issue: 32 Pages: 502-506 Published: 2000
50. Sreekanth Mandati, **Bulusu V. Sarada**, Suhash R. Dey and Shrikant V. Joshi, Pulse electrodeposition and characterization of CIGS thin-films for solar applications., ELAC-2013, Fifth ISEAC Triennial International Conference on Advances and Recent Trends in Electrochemistry, Hyderabad,
51. R. Subasri, S. Manasa, Swapnil H. Adsul, **B.V. Sarada**, Micro-Raman Spectroscopic Studies for Evaluation of Self-Healing Property of Corrosion Protection Coatings on Al and Mg alloys, Proceedings of CORCON 2017

List of Book chapters:

1. **Sarada B V**, Terashima, C, Ivandini T A, Rao, T N, Fujishima, A, "Diamond Electrochemistry", Elsevier B V, 2005
2. Olivia, H, **Sarada, B V**, Rao, T N, Fujishima, A, "Diamond Electrochemistry", Elsevier B V, 2005
- 3 Nanomanufacturing for Aerospace Applications, S. Anandan, H. Neha, **B. V. Sarada**, T. N. Rao, *Aerospace Materials and Technologies*, Edited by: Prasad, N. Eswara, Wanhill, R. J. H, Volume 2, 2016. Pp85.
- 4 Sreekanth Mandati, Suhash R. Dey, Shrikant V. Joshi and Bulusu V. Sarada, Pulsed Electrochemical Deposition of CuInSe₂ and Cu(In,Ga)Se₂ Semiconductor Thin Films, *Semiconductors - Electrochemical Growth and Characterization*. ISBN no: 978-953-51-5589-8, 109-132, (2018).

List of Patents:

1. Test-substance concentration measuring method e.g. for urine involves measuring electric current difference corresponding to oxidation/reduction reaction of either

ascorbic acid/ascorbic and uric acid to measure uric acid concentration

Patent Number: **JP2004101437-A; JP3703787-B2** Publication date: 2004-04-02

2. Detection method of inspection compound, and diamond electrode and device used therefore. Patent Number: JP2003121410, Publication date: 2003-04-23

3. Electrochemical Assay using an electroconductive diamond coated electrode, and electrochemical assay system based thereon. Patent Number: **EP1055926A2, EP1055926A3, WO200198766-A; WO200198766-A1; AU200174581-A; JP2002504478-X**

4. Thiol concentration measuring method and sensor used for the same, **JP2002189016A2**. Publication date: 2002-07-05

5. Method for determining concentration of xanthin type compound and sensor for use therein. **WO0198766A1**, Publication date: 2001-12-27

6. Density measuring method e.g for chemical samples
Patent Number: **EP1055926-A; EP1055926-A2; JP2001021521-A; JP2001050924-A; CN1278063-A; JP2001091499-A; JP2001147211-A; KR2001020722-A; KR360991-B; TW528867-A; JP4390345-B2**

7. Novel copper foils having high hardness and conductivity and a pulse reverse electrodeposition method for their preparation. **Patent Application No. 1028/DEL/2009 (Granted)**

8. An Improved method of preparing bulk porous silicon compacts. Indian patent filed. **IN201100912-II(Granted)**

9. A Novel Electrochemical Method for Manufacturing CIGS Thin-Films Containing Nanomesh-like Structures, **426/DL/2015**

Awards/Honours:

- Student Fellowship/ Post-doc Fellowship, Japan Society for the Promotion of Science, Japan (1999).
- Post Doctoral Fellowship/ Japan Society for the Promotion of Science, Japan (2000).
- Fellowship under Woman Scientist Scheme, Department of Science and Technology (DST), India (2006)

Affiliation to Professional Societies:

1. Member of 'The Electrochemical Society of India'
2. Member of 'MRSI, India'
3. Editorial Board member for 'Scientific Reports –Nature Publishing Group'