



**Dr. R. SIVAKUMAR**  
**Assistant Professor**

**Contact**

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**Academic Qualifications: M.Sc., M.Phil., Ph.D.**

**Teaching Experience: 8 Years**

**Research Experience: 14 Years**

**Additional Responsibilities**

1. **Committee Member:** Assisted to the Department as one of the committee members for the successful completion of various Departmental activities.
2. **University Representative:** Visited various examination centers in India to oversee the conduct of Alagappa University Distance Education Examinations (May 2009 onwards).
3. **Board of Studies Member:** Acted as a Member of the Board of Studies in Physics of Directorate of Distance Education, Alagappa University for a period of three years from September 2015.

4. **Co-ordinator:** Acted as a Co-ordinator to conduct Personal Contact Programme for M.Sc. (Physics) programme offered under Directorate of Distance Education, Alagappa University from the Academic year 2015-2016.

### Areas of Research

Thin films preparation and characterization, Transition metal oxides for electrochromic device, Semiconductor materials for solar cell, Various forms of nanostructures by solution route, Ion beam induced studies.

### Research Supervision / Guidance

Program of Study		Completed	Ongoing
Research	Ph.D.	4	5
	M.Phil.	-	4
Project	PG	-	5

### Publications

International		National		Others
Journals	Conferences	Journals	Conferences	Books / Chapters / Monographs / Manuals
59	49	--	23	6

<b>Cumulative Impact Factor (as per JCR) :</b>	<b>33</b>
<b>h-index :</b>	<b>13</b>
<b>i10 index :</b>	<b>18</b>
<b>Total Citations :</b>	<b>565</b>

## Funded Research Projects

### Completed Projects

S. No.	Agency	Period		Project Title	Budget (Rs. In lakhs)
		From	To		
1	Alagappa University	30.09.2009	30.09.2010	Growth of ZnO nanostructures by aqueous solution growth method	0.64 lakhs
2	Department of Science and Technology	01.11.2010	31.10.2013	Preparation and characterization of electrochromic oxide thin films for electrochromic device	19.95 lakhs

### Ongoing Projects

S. No.	Agency	Period		Project Title	Budget (Rs. In lakhs)
		From	To		
1	University Grants Commission	01.04.2013	31.03.2017	Studies on diluted magnetic semiconductor thin film prepared by chemical methods	12.44 lakhs

## Distinctive Achievements / Awards

1. **Senior Research Fellowship** (Direct Awardee, CSIR-SRF), awarded by Council of Scientific and Industrial Research (CSIR), New Delhi, India (April – November 2005).
2. **Post-Doctoral Fellowship**, awarded by Institute of Physics, Bhubaneswar, India (December, 2005 – October, 2006).
3. **Post-Doctoral Fellowship**, awarded by National Taiwan University, Taipei, Taiwan (November, 2006 – October, 2007).
4. **Post-Doctoral Fellowship**, awarded by Nagaoka University of Technology, Nagaoka, Japan (December, 2007 – February, 2009).
5. **Young Scientist Award** for the year 2010-2011, from Tamilnadu State Council for Science and Technology (TNSCST), Chennai.

6. **Alagappa Excellence Award for Research** for the year 2015-2016, from Alagappa University, Karaikudi.
7. **Best paper presentation award** from Indian Science Congress Association (ISCA) (Chennai chapter), Kolkatta, India, during the year 2005.
8. **Reviewer** – International journal: Materials Letters; Ceramics International; Journal of Solid State Electrochemistry; Latin-American Journal of Physics Education; Advanced Materials Letter; Advances in Materials Science and Engineering; Journal of Thermoplastic Composite Materials; Electrochimica Acta; Journal of Alloys and Compounds; Applied Physics A; ACS Applied Materials and Interfaces; Journal of Vacuum Science and Technology A; Journal of Applied Physics
9. **Scientific and Technical Committee** member for various National Conferences, Seminars, and Symposiums

## Events Participated

**Conferences / Seminars / Workshops: 72**

### Other Training Programs

1. Attended the UGC sponsored 66<sup>th</sup> Orientation Programme held at UGC-Academic Staff College, Bharathidasan University, Tiruchirappalli, Tamilnadu, during November 08 – December 06, 2010.
2. Attended the UGC sponsored Refresher Course in Physics held at UGC-Academic Staff College, Bharathidasan University, Tiruchirappalli, Tamilnadu, during November 20 – December 10, 2012.
3. Attended the UGC sponsored Refresher Course in Physics held at UGC-Human Resource Development Centre, Bharathidasan University, Tiruchirappalli, Tamilnadu, during February 17 – March 08, 2016.

## Overseas Exposure / Visits

1. National Taiwan University, Taiwan, Post-Doctoral Fellowship, during November, 2006 to October, 2007.
2. Nagaoka University of Technology, Japan, Post-Doctoral Fellowship, during December, 2007 to February, 2009.

3. Tokyo University of Technology, Japan, Annual Meeting of The Ceramic Society of Japan 2009, during March 14-22, 2009.

## Membership in

### Professional Bodies

1. Life Member: Indian Science Congress Association, India
2. Life Member: Materials Research Society of India, India
3. Annual Member: Ceramic Society of Japan, Japan (2008-2009)

### Editorial Board

1. **Guest Editor** for the Special issue on Conductive Polymers and their Applications of the journal Smart Materials Research

### Academic Bodies (such as Board of Studies etc.,)

1. **Board of Studies Member:** Acted as a Member of the Board of Studies in Physics of Directorate of Distance Education, Alagappa University for a period of three years from September 2015.

## Resource persons in various capacities

Number of Invited / Special Lectures delivered: 14

## Others

1. No. of PhD Thesis evaluated : 05
2. No. of PhD Public Viva Voce Examination conducted : 04

## Recent Publications

1. T. Dhandayuthapani, **R. Sivakumar**, and R. Ilangoan; Growth of micro flower rutile TiO<sub>2</sub> films by chemical bath deposition technique: Study on the properties of structural, surface morphological, vibrational, optical and compositional, *Surf. Inter.* 4, **2016**, 59-68.
2. D. Rachel Malini, **R. Sivakumar**, C. Sanjeeviraja; Annealing effects on V<sub>2</sub>O<sub>5-x</sub> thin films deposited by non reactive sputtering, *Nanosystems: Phys. Chem. Math.* 7, **2016**, 547-552.

3. C. Ravi Dhas, R. Venkatesh, **R. Sivakumar**, A. Moses Ezhil Raj, C. Sanjeeviraja; Fast electrochromic response of porous-structured cobalt oxide ( $\text{Co}_3\text{O}_4$ ) thin films by novel nebulizer spray pyrolysis technique, *Ionics* 22, **2016**, 1911-1926. (IF: 2.119).
4. K.S. Usha, **R. Sivakumar**, C. Sanjeeviraja, Vasant Sathe, V. Ganesan, T.Y. Wang; Improved electrochromic performance of a radio frequency magnetron sputtered NiO thin film with high optical switching speed, *RSC Adv.* 6, **2016**, 79668-79680. (IF: 3.298).
5. N. Usha, **R. Sivakumar**, C. Sanjeeviraja, R. Balasubramaniam, Y. Kuroki; Mixed  $\text{Nb}_2\text{O}_5:\text{MoO}_3$  (95:5 and 85:15) thin films and their properties for electrochromic device applications, *J. Mater. Sci.: Mater. Electron.* 27, **2016**, 7809-7821. (IF: 1.569).
6. M. Meenakshi, **R. Sivakumar**, P. Perumal, C. Sanjeeviraja; Studies of RF sputtered  $(\text{WO}_3)_{1-x}(\text{V}_2\text{O}_5)_x$  thin films for smart window applications, *AIP Conf. Proc.* 1731, **2016**, 080070-3.
7. S.R. Cynthia, **R. Sivakumar**, C. Sanjeeviraja, S. Ponmudi; Characterization of  $\text{ZnO}:\text{SnO}_2$  (50:50) thin film deposited by RF magnetron sputtering technique, *AIP Conf. Proc.* 1728, **2016**, 020567-5.
8. S. Ponmudi, **R. Sivakumar**, C. Sanjeeviraja; Studies on the properties of  $\text{Al}_2\text{O}_3:\text{Cr}_2\text{O}_3$  (50:50) thin film, *AIP Conf. Proc.* 1728, **2016**, 020288-4.
9. T. Dhandayuthapani, **R. Sivakumar**, R. Ilangovan; Single step synthesis of rutile  $\text{TiO}_2$  nanoflower array film by chemical bath deposition method, *AIP Conf. Proc.* 1728, **2016**, 020286-4.
10. M. Meenakshi, **R. Sivakumar**, P. Perumal, C. Sanjeeviraja; Studies on electrochromic properties of RF sputtered vanadium oxide: tungsten oxide thin films, *Mater. Today: Proc.* 3S, **2016**, S30-S39.
11. M. Kamalanathan, S. Karuppusamy, **R. Sivakumar**, R. Gopalakrishnan; Synthesis of reduced graphene oxide - copper tin sulphide composites and their photoconductivity enhancement for photovoltaic applications, *J. Mater. Sci.* 50, **2015**, 8029-8037. (IF: 2.371).
12. N. Usha, **R. Sivakumar**, C. Sanjeeviraja, Y. Kuroki; Effect of substrate temperature on the properties of  $\text{Nb}_2\text{O}_5:\text{MoO}_3$  (90:10) thin films prepared by rf magnetron sputtering technique, *J. Alloys Compd.* 649, **2015**, 112-121. (IF: 2.999).
13. T. Dhandayuthapani, M. Girish, **R. Sivakumar**, C. Sanjeeviraja, R. Gopalakrishnan; Tuning the morphology of metastable MnS films by simple chemical bath deposition technique, *Appl. Surf. Sci.* 353, **2015**, 449-458. (IF-2.711).

14. M. Girish, **R. Sivakumar**, C. Sanjeeviraja, Y. Kuroki; A facile approach called nebulized spray pyrolysis to deposit MnS thin films: effect of solution concentration with EDTA on the physical properties, *Optik* 126, **2015**, 2074-2079. (IF: 0.677).
15. N. Usha, **R. Sivakumar**, C. Sanjeeviraja, M. Arivanandhan; Niobium pentoxide (Nb<sub>2</sub>O<sub>5</sub>) thin films: rf power and substrate temperature induced changes in physical properties, *Optik* 126, **2015**, 1945-1950. (IF: 0.677).
16. M. Meenakshi, V. Gowthami, P. Perumal, **R. Sivakumar**, C. Sanjeeviraja; Influence of dopant concentration on the electrochromic properties of tungsten oxide thin films, *Electrochimica Acta* 174, **2015**, 302-314. (IF: 4.504).
17. M. Girish, T. Dhandayuthapani, **R. Sivakumar**, C. Sanjeeviraja; MnS thin films prepared by a simple and novel nebulizer technique: report on the structural, optical, and dispersion energy parameters, *J. Mater. Sci.: Mater. Electron.* 26, **2015**, 3670-3684. (IF: 1.569).
18. K. Punitha, **R. Sivakumar**, C. Sanjeeviraja, V. Ganesan; Influence of post-deposition heat treatment on optical properties derived from UV-vis of cadmium telluride (CdTe) thin films deposited on amorphous substrate, *Appl. Surf. Sci.* 344, **2015**, 89-100. (IF: 2.711).
19. K.S. Usha, **R. Sivakumar**, C. Sanjeeviraja; Effect of substrate temperature on structural and optical properties of nickel tungsten oxide thin films, *J. Mater. Sci.: Mater. Electron.* 26, **2015**, 1033-1044. (IF: 1.569).
20. T. Dhandayuthapani, M. Girish, **R. Sivakumar**, C. Sanjeeviraja, R. Gopalakrishnan; Metastable MnS films prepared by the addition of EDTA using chemical bath deposition technique, *Int. J. ChemTech Res.* 7, **2015**, 974-978.
21. K.S. Usha, **R. Sivakumar**, C. Sanjeeviraja, M. Ichimura; Physical properties of rf magnetron sputter deposited NiO:WO<sub>3</sub> thin films, *Mater. Res. Express* 2, **2015**, 016401-14.
22. N. Usha, **R. Sivakumar**, C. Sanjeeviraja; Electrochromic properties of radio frequency magnetron sputter deposited mixed Nb<sub>2</sub>O<sub>5</sub>:MoO<sub>3</sub> (95:5) thin films cycled in H<sup>+</sup> and Li<sup>+</sup> ions, *Mater. Sci. Semicond. Process.* 30, **2015**, 31-40. (IF: 1.955).
23. K. Punitha, **R. Sivakumar**, C. Sanjeeviraja, Vasant Sathe, V. Ganesan; Physical properties of electron beam evaporated CdTe and CdTe:Cu thin films, *J. Appl. Phys.* 116, **2014**, 213502-10. (IF: 2.183).
24. V. Gowthami, M. Meenakshi, P. Perumal, **R. Sivakumar**, C. Sanjeeviraja; Optical dispersion characterization of NiO thin films prepared by nebulized spray technique, *Int. J. ChemTech Res.* 6, **2014**, 5196-5202.
25. N. Usha, **R. Sivakumar**, C. Sanjeeviraja; Characterization on RF magnetron sputtered niobium pentoxide thin films, *AIP Conf. Proc.* 1620, **2014**, 339-343.

26. M. Girish, **R. Sivakumar**, C. Sanjeeviraja; A simple approach to deposit MnS thin films, *AIP Conf. Proc.* 1620, **2014**, 235-239.
27. K.S. Usha, **R. Sivakumar**, C. Sanjeeviraja; Studies on nickel-tungsten oxide thin films, *AIP Conf. Proc.* 1620, **2014**, 202-205.
28. M. Girish, T. Dhandayuthapani, **R. Sivakumar**, C. Sanjeeviraja; Physical properties of MnS films deposited by nebulizer technique, *Asian J. Applied. Sci.* 7, **2014**, 729-736.
29. V. Gowthami, M. Meenakshi, P. Perumal, **R. Sivakumar**, C. Sanjeeviraja; Preparation of rod shaped nickel oxide thin films by a novel and cost effective nebulizer technique, *Mater. Sci. Semicond. Process.* 27, **2014**, 1042-1049. (IF: 1.955).
30. M. Girish, T. Dhandayuthapani, **R. Sivakumar**, C. Sanjeeviraja; The effect of TEA on structural and optical properties of nebulized spray deposited MnS thin films, *Int. J. ChemTech Res.* 6, **2014**, 3361-3363.
31. V. Gowthami, P. Perumal, **R. Sivakumar**, C. Sanjeeviraja; Structural and optical studies on nickel oxide thin film prepared by nebulizer spray technique, *Physica B: Condens. Matter.* 452, **2014**, 1-6. (IF: 1.319).
32. K. Punitha, **R. Sivakumar**, C. Sanjeeviraja; Enhanced colouration efficiency of pulsed DC magnetron sputtered WO<sub>3</sub> films cycled in H<sub>2</sub>SO<sub>4</sub> electrolyte solution, *Smart Mater. Res.* 2014, **2014**, 151732-9.
33. T.S. Shyju, S. Anandhi, **R. Sivakumar**, R. Gopalakrishnan; Studies on lead sulfide (PbS) semiconducting thin films deposited from nanoparticles and its NLO application, *Inter. J. Nanosci.* 13, **2014**, 1450001-12.
34. K. Punitha, **R. Sivakumar**, C. Sanjeeviraja; Pulsing frequency induced change in optical constants and dispersion energy parameters of WO<sub>3</sub> films grown by pulsed direct current magnetron sputtering, *J. Appl. Phys.* 115, **2014**, 113512-11. (IF: 2.183).
35. **R. Sivakumar**, K. Punitha, C. Sanjeeviraja, R. Gopalakrishnan; Morphology control of ZnO nanostructures by catalyst-free and seed-mediated simple aqueous solution growth method, *Mater. Lett.* 121, **2014**, 141-144. (IF: 2.489).
36. K.S. Usha, **R. Sivakumar**, C. Sanjeeviraja; Optical constants and dispersion energy parameters of NiO thin films prepared by radio frequency magnetron sputtering technique, *J. Appl. Phys.* 114, **2013**, 123501-10. (IF: 2.183).
37. K.S. Usha, C. Sanjeeviraja, **R. Sivakumar**; Influence of RF power on optical and morphological properties of NiO thin films, *AIP Conf. Proc.* 1536, **2013**, 613-614.
38. T.S. Shyju, S. Anandhi, **R. Sivakumar**, S.K. Garg, R. Gopalakrishnan; Investigation on structural, optical, morphological and electrical properties of thermally deposited



lead selenide (PbSe) nanocrystalline thin films, *J. Cryst. Growth* 353, **2012**, 47-54. (IF: 1.698).

39. **R. Sivakumar**, T. Tsunoda, Y. Kuroki, T. Okamoto, M. Takata; ZnO nanowire growth by electric current heating method: a study on the effect of substrate temperature, *Mater. Chem. Phys.* 134, **2012**, 345-349. (IF: 2.259).
40. K. Punitha, **R. Sivakumar**, C. Sanjeeviraja; Structural and surface morphological studies of magnesium tin oxide thin films, *Energy Procedia* 15, **2012**, 312-317. (IF: 0.786)
41. **R. Sivakumar**, K. Shanthakumari, A. Thayumanavan, M. Jayachandran, C. Sanjeeviraja; Molybdenum oxide (MoO<sub>3</sub>) thin film based electrochromic cell characterization in 0.1 M LiClO<sub>4</sub>.PC electrolyte, *Surface Engineering* 25, **2009**, 548-554. (IF: 1.197).
42. T.Y. Wang, Y.C. Lin, C.Y. Tai, **R. Sivakumar**, D.K. Rai, C.W. Lan; A novel approach for recycling of kerf loss silicon from cutting slurry waste for solar cell applications, *J. Cryst. Growth* 310, **2008**, 3403-3406. (IF: 1.698). (Ranked 6<sup>th</sup> place in the Science Direct top 25 hottest articles, July – September 2008).
43. T. Som, J. Ghatak, O.P. Sinha, **R. Sivakumar**, D. Kanjilal; Recrystallization of ion-irradiated germanium due to intense electronic excitation, *J. Appl. Phys.* 103, **2008**, 123532-5. (IF: 2.183).
44. **R. Sivakumar**, C. Sanjeeviraja, M. Jayachandran, R. Gopalakrishnan, S.N. Sarangi, D. Paramanik, T. Som; High temperature grown transition metal oxide thin films: tuning physical properties by MeV N<sup>+</sup>-ion bombardment, *J. Phys. D: Appl. Phys.* 41, **2008**, 125304-8. (IF: 2.721).
45. T.Y. Wang, **R. Sivakumar**, D.K. Rai, W.T. Hsu, C.W. Lan; A new single step process for synthesis and growth of ZnGeP<sub>2</sub> crystal, *J. Chinese Institute of Chemical Engineers* 39, **2008**, 385-387. (IF: 3.000).
46. **R. Sivakumar**, K. Shanthakumari, A. Thayumanavan, M. Jayachandran, C. Sanjeeviraja; Coloration and bleaching mechanism of tungsten oxide thin films in different electrolytes, *Surface Engineering* 23, **2007**, 373-379. (IF: 1.197).
47. **R. Sivakumar**, C. Sanjeeviraja, M. Jayachandran, R. Gopalakrishnan, S.N. Sarangi, D. Paramanik, T. Som; Modification of WO<sub>3</sub> thin films by MeV N<sup>+</sup>-ion beam irradiation, *J. Phys.: Condens. Matter.* 19, **2007**, 186204-9. (IF: 2.346).
48. **R. Sivakumar**, C. Sanjeeviraja, M. Jayachandran, R. Gopalakrishnan, S.N. Sarangi, D. Paramanik, T. Som; MeV N<sup>+</sup>-ion irradiation effects on  $\alpha$ -MoO<sub>3</sub> thin films, *J. Appl. Phys.* 101, **2007**, 034913-5. (IF: 2.183). *Virtual J. Nanoscale Sci. Technol.* Vol. 15, Issue 8, Feb. 26, 2007.
49. **R. Sivakumar**, R. Gopalakrishnan, M. Jayachandran, C. Sanjeeviraja; Preparation and characterization of electron beam evaporated WO<sub>3</sub> thin films, *Optical Materials* 29,

2007, 679-687. (IF: 1.981). (Ranked 12<sup>th</sup> place in the Science Direct top 25 hottest articles, January – March 2007).

50. **R. Sivakumar**, C.S. Gopinath, M. Jayachandran, C. Sanjeeviraja; An electrochromic device (ECD) cell characterization on electron beam evaporated MoO<sub>3</sub> films by intercalating/deintercalating the H<sup>+</sup> ions, *Current Applied Physics* 7, **2007**, 76-86. (IF: 2.212).
51. **R. Sivakumar**, R. Gopalakrishnan, M. Jayachandran and C. Sanjeeviraja; Characterization on electron beam evaporated  $\alpha$  - MoO<sub>3</sub> thin films by the influence of substrate temperature, *Current Applied Physics* 7, **2007**, 51-59. (IF: 2.212).
52. **R. Sivakumar**, P. Manisankar, M. Jayachandran, C. Sanjeeviraja; Intercalation studies on electron beam evaporated MoO<sub>3</sub> films for electrochemical devices, *Sol. Energy Mater. Sol. Cells* 90, **2006**, 2438-2448. (IF: 5.337).
53. **R. Sivakumar**, R. Gopalakrishnan, M. Jayachandran, C. Sanjeeviraja; Investigation on the X-ray photoelectron spectroscopic (XPS), cyclic voltammetric analyses of WO<sub>3</sub> films and their electrochromic response in FTO/WO<sub>3</sub>/electrolyte/FTO cells, *Smart Mater. Struct.* 15, **2006**, 877-888. (IF: 2.502).
54. M. Gunasekaran, R. Gopalakrishnan, **R. Sivakumar**, P. Ramasamy, M. Ichimura; Deposition of cadmium sulphide and cadmium zinc sulphide thin films by photochemical deposition (PCD) technique and its characterization, *Surface Engineering* 22, **2006**, 73-77. (IF: 1.197).
55. **R. Sivakumar**, V. Vijayan, V. Ganesan, M. Jayachandran, C. Sanjeeviraja; Electron beam evaporated molybdenum oxide films: a study of elemental and surface morphological properties, *Smart Mater. Struct.* 14, **2005**, 1204-1209. (IF: 2.502).
56. **R. Sivakumar**, V. Ganesan, V. Vijayan, M. Jayachandran, C. Sanjeeviraja; Particle induced X-ray emission spectroscopic (PIXE) and surface morphological (AFM) studies on electron beam evaporated WO<sub>3</sub> thin films, *Surface Engineering* 21, **2005**, 315-319. (IF: 1.197).
57. **R. Sivakumar**, M. Jayachandran, C. Sanjeeviraja; Effect of annealing on structural, surface and optical properties of  $\alpha$  - MoO<sub>3</sub> thin films by PVD: EBE for electrochromic devices, *Surface Engineering* 20, **2004**, 385-390. (IF: 1.197).
58. **R. Sivakumar**, M. Jayachandran, C. Sanjeeviraja; Studies on the effect of substrate temperature on (VI-VI) textured tungsten oxide (WO<sub>3</sub>) thin films on glass, SnO<sub>2</sub>:F substrates by PVD: EBE technique for electrochromic devices, *Mater. Chem. Phys.* 87, **2004**, 439-445. (IF: 2.259).
59. **R. Sivakumar**, A. Moses Ezhil Raj, B. Subramanian, M. Jayachandran, D.C. Trivedi, C. Sanjeeviraja; Preparation and characterization of spray deposited n-type WO<sub>3</sub> thin films for electrochromic devices, *Mater. Res. Bull.* 39, **2004**, 1479-1489. (IF: 2.288).