Curriculum Vitae

Dr. Sivaprakash, S.

Scientist 'C',
Center for Advanced Materials Processing,
CSIR-Central Mechanical Engineering Research Institute,
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Young researcher with ten (10) years of experience in electroceramic materials synthesis and characterization in India and USA. Six publication in peer reviewed journals, one book chapter and number of conference presentation and publication in India and abroad.

Current Projects

- "Feasibility Study Of Graphene Based PCM Cooling For Battery Thermal Management System"
  Year: 2016–2017, Funding: 8.00 lakh, Role: Task Member
  Agency: CSIR-Central Mechanical Engineering Research Institute, Durgapur.

Completed Projects

- "Lithium/Oxygen Battery Test Facility and Studies on Air Breathing Electrode: An Initiative"
  Year: 2011–2015, Funding: 47.30 lakh, Role: PI
  Agency: CSIR-Central Mechanical Engineering Research Institute, Durgapur.

- "Novel Silicon Based Anode Material for Lithium-Ion Rechargeable Batteries"
  Year:2012–2015, Funding:19.45 lakh, Role: PI
  Agency: DST Fast Track Scheme

- "Development of Advanced Multifunctional Materials for Electrochemical Energy Devices"
  Year: 2013–2016, Role: Task member.
  Agency: India-Taiwan Programme of Cooperation in Science and Technology
  Host: Indian Institute of Science, Bangalore.

- "Novel Synthesis of Lithium Iron Phosphate for Lithium-Ion Rechargeable Batteries"
  Year: 2010–2012, Funding: 31.11 lakh, Role: PI
  Agency: CSIR-Central Mechanical Engineering Research Institute.

Teaching Experience

- Honorary *Assistant Professor* of the Academy in the Faculty of Engineering Sciences - Academy of Scientific and Innovative Research (AcSIR) from March 2014 to till date.
- *Co-guide* - One M.Tech student from Indian Institute of Technology Kharagpur.
- *DSC member*- for two PhD students in AcSIR, CSIR-CMERI, Durgapur.

ACADEMIC QUALIFICATIONS

✻ **Ph.D. (Electro-Ceramics)**, Materials Science Center, Indian Institute of Technology Kharagpur, West Bengal, India. Year: 2006-2010.
Thesis title: *High Energy Density Layered Oxide Cathode Materials for Lithium Rechargeable Batteries*

✻ **M.Tech., Ceramic Technology**, A.C.Tech, Anna University, TamilNadu with CGPA of 8.716 out of 10 and year of completion - April 2004

✻ **B.Tech., Chemical Engineering**, Dr Navalar Nedunchezhiyan College of Engineering, University of Madras with 73.9% and year of completion - April 2002

RESEARCH EXPERIENCE

Material Synthesis

✯ Synthesized cathode and anode for Li ion rechargeable battery through solid state route and/or wet chemical synthesis route.(e.g. Layered, spinel and layered composite cathode, conversion and alloying anode).

✯ Studies on Lithium-Air batteries and super-capacitor (Synthesis, analysis and testing).

✯ Synthesized nano sized powders for Li ion rechargeable battery through bottom up (wet-chemical synthesis) and top down approach (High energy ball mill).

Characterization

✯ Expertise in using XRD, SEM/TEM, micro-Raman spectroscopy, XPS, impedance spectroscopy, cyclic voltammetry, charge-discharge measurements, and cycleability for Lithium ion rechargeable batteries and Supercapacitor.

Experience

✯ Experienced in well renowned lab (**University of Puerto Rico, USA**.) for synthesizing cathode materials, characterization and fabrication of coin cell and handling of glove box.

- ✯ Experienced in well equipped lab (**LIB Lab, Dept. of Metallurgical and Materials Engg., IIT Kharagpur**.) to synthesize cathode and anode laminates, fabrication of cylindrical and prismatic cell in dry room.

- ✯ Experienced in developing well equipped lab (**CSIR-CMERI**.) to synthesize cathode/ anode laminates, separator for LIB coin cells assemblies, Lithium-Air batteries and Super-capacitor.

INDUSTRIAL EXPERIENCE

- ➪ Worked as a Junior Manager - Quality Control from 26.8.2004 to 15.6.2006 in Somany Tiles Ltd, Kassar, Floor and Wall Tiles manufacturing unit (Somany Group).

- ➪ Nature of work- Manage and govern quality control process parameters of incoming raw material, process specification, finished product, final checking and assurance.

Industrial achievement

- ➪ 43% saving in grinding time in case of Silica ball mill grinding (There was a reduction in grinding time from 16 hours to 9 hours)

- ➪ 9 kWh/Ton of Specific power consumption saving was achieved in the Silica ball mill grinding

Memberships in Professional organizations

- ➪ **Life Member**- Indian Institute of Chemical Engineers (IIChE). (LAM#36375)

- ➪ **Life Member** - Indian Science Congress Association (ISCA). (M.No#L15875)

- ➪ **Life Member** - Materials Research Society of India (MRSI). (M.No#LMB1847)

Awards and fellowships

- ✍ "IEI Young Engineer Award"- in Chemical Engineering Discipline 2013.

- ✍ "DST Fast Track Scheme"- in Engineering Sciences 2012–2015.

- ✍ Best poster Presentation Award (First Prize, 49^{th} RC meeting) for "Fabrication of ceramics substrate and lithium hydroxide deposition for CO_2 absorption" from CSIR-CMERI, 2013.

- ✍ "Institute scholar"- Indian Institute of Technology Kharagpur 2006-2009.

- ✍ DST has granted "International Travel Support Scheme" during 2009.

- ✍ Two of our XRD power pattern published in **ICDD powder diffraction file**.

Abroad visit

✍ Visiting Researcher, Department of Physics, University of Puerto Rico from Nov 2007 to May 2008.

Lecture series organized in CSIR-CMERI

✍ Dr. C.K. Das, Professor, IIT Kharagpur.

✍ Dr. Raju Kumar Gupta , IIT Kanpur.

Responsibilities & contribution

✓ **Reviewer**- Journals

✓ **Project Coordinator** -Energy saving in milling equipments and characterization of ***particle size analysis***, SPL Ltd, Kassar, Haryana.

✓ **Volunteer** (2006–2009)- Winter School, International Conference on Hi-Tech Materials (Handling Conference Hall Management), IIT-Kharagpur.

✓ **Active Member** (2004-2006)- Kaizen Promotion committee, SPL ltd, Kassar, Haryana.

✓ **Secretary**(2000-2002)- Environmental Awareness Association, Dr.N.N. College of Engg., TamilNadu.

Scientific Interests

✯ Li-ion Rechargeable Batteries
✯ Li-Air Rechargeable Batteries
✯ Hybrid Super-capacitor
✯ Solid Oxide Fuel Cell

Publications and Presentation

Book chapter

1. Synthesis and characterization of active-inactive layered oxide composite materials for lithium rechargeable batteries, Advances in Energy Research. Volume 8, Editors: Morena V. Acosta, ISBN: 978-1-61324-208-7, Nova Science Publishers, Inc.

Publication

1. **S. Sivaprakash** , R.S. Katiyar, S.Nieto and S.B. Majumder,"Crystal chemistry modification of lithium nickel cobalt oxide cathodes for lithium ion rechargeable batteries", *J.Power Sources*, 170, 433–440 (2007). doi:10.1016/j.jpowsour.2007.04.029

2. **S. Sivaprakash**, R.S. Katiyar and S.B. Majumder,"Investigations on 0.5 $Li(Ni_{0.8}Co_{0.15}Zr_{0.05})O_2$- 0.5 $Li(Li_{1/3}Mn_{2/3})O_2$ cathode for Li rechargeable batteries", *J. Electrochem. Soc.*, 156 (4), A328–A333(2009). http://dx.doi.org/10.1149/1.3078401

3. **S. Sivaprakash** and S.B. Majumder, "Understanding the role of Zr^{4+} cation in improving the cycleability of $LiNi_{0.8}Co_{0.15}Zr_{0.05}O_2$ cathodes for Li ion rechargeable batteries", *J. Alloys Compd.*, 479, 561–568 (2009). doi:10.1016/j.jallcom.2008.12.129

4. **S. Sivaprakash** and S.B. Majumder,"Spectroscopic analyses of $0.5Li(Li_{1/3}Mn_{2/3})O_2$-$0.5Li(Ni_{0.8}Co_{0.15}Zr_{0.05})O_2$ composite cathodes for lithium rechargeable batteries", *Solid State Ionics*, 181, 730-739(2010). http://dx.doi.org/10.1016/j.ssi.2010.04.006

5. **S. Sivaprakash** and S.B. Majumder,"Synthesis and electrochemical characteristics of $Li(Ni_{0.375}Mn_{0.375}Co_{0.25})O_2$-$Li(Li_{1/3}Mn_{2/3})O_2$ cathode materials for Li rechargeable batteries", *J. Electrochem. Soc.*, 157, A418–A422(2010). http://dx.doi.org/10.1149/1.3292603

6. Prabhavathy Sivaprakash, P.K. Sen and **S. Sivaprakash**,"Enhanced electrochemical performance of nanoparticle coated polyethylene separator surface for lithium-ion batteries", *Materials Research Express*, 4(1), 045504 (2014). doi:10.1088/2053-1591/1/4/045504

7. **S. Sivaprakash** and Prabhavathy Sivaprakash, "A facile synthesis of graphene foam as electrode material for super-capacitor", *Materials Research Express*, 3(7), 075020 (2016). http://dx.doi.org/10.1088/2053-1591/3/7/075020

Other

8. V. Meriga, S. Valligatla, **S. Sundaresan**, C. Cahill, V.R. Dhanak, A.K. Chakraborty,"Optical, electrical, and electrochemical properties of graphene based water soluble polyaniline composites", *J. Appl. Polym. Sci.*, 132, 42766 (2015). doi:10.1002/app.42766

Conference paper

1. **S. Sivaprakash**, R.S. Katiyar and S.B. Majumder,"Electrochemical and Structural Investigations of $xLi[Li_{0.33}Mn_{0.66}]O_2(1\text{-}x)Li[Ni_{0.8}Co_{0.15}Zr_{0.05}]O_2$ $(0.3 \leq x \leq 0.7)$ Composite Layered Oxide Cathode for Rechargeable Lithium Ion Batteries", ECS Transactions, 13, 115–122 (2008).

   http://dx.doi.org/10.1149/1.3018756

2. **S. Sivaprakash** and S.B. Majumder,"Unconventional Lithium Intercalation in Active: Inactive Composite Cathode for Li Rechargeable Batteries", International Symposium for Research Scholars on Metallurgy, Materials Science and Engineering Proceedings, IIT Madras, India, 103–107 (2008). http://metallurgy.iitm.ac.in/isrs/isrs08/

Oral Presentation

1. **S. Sivaprakash** and S.B. Majumder, (2007), "Crystal Chemistry Modification of Lithium Nickel Cobalt Oxide Cathodes for Lithium Ion Rechargeable Batteries", *National Conference on Emerging Trend in Engineering Materials*, 1–3 February, Thapar University, Patiala, Punjab, India.

2. **S.Sivaprakash** and S.B. Majumder, (2007), "Structural Investigation on Active-inactive Composite Layered Oxide Cathode for Lithium-ion Rechargeable Batteries", *Millennium Energy Summit-2007*, 27–29 September, CGCRI Kolkata, West Bengal, India.

3. **S.Sivaprakash**, J. Saavedra, R.S. Katiyar and S.B. Majumder, (2008), "Electrochemical and Structural investigations of xLi[$Li_{0.33}Mn_{0.66}$]O_2 (1-x) Li[$Ni_{0.8}Co_{0.15}Zr_{0.05}$]$O_2$ ($0.0 \leq x \leq 1.0$) composite layered oxide cathode for rechargeable lithium ion batteries", *213th Electrochemical Society Meeting*, 18–22 May, Phoenix, Arizona, USA.

4. **S. Sivaprakash** and S.B. Majumder, (2008), "Unconventional Lithium Intercalation in Active: Inactive Composite Cathode for Li Rechargeable Batteries", *International Symposium for Research Scholars on Metallurgy, Materials Science and Engineering*, 10–12 December, IIT Madras, Tamil Nadu, India.

5. **S. Sivaprakash** and S.B. Majumder, (2009), "Overcapacity in Active: Inactive Composite Cathode for Li Rechargeable Batteries", *International Conference on Hi-Tech Materials*, 11–13 February, IIT Kharagpur, West Bengal, India.

6. **S. Sivaprakash** and S. Majumder, (2009), "Synthesis and Electrochemical Characteristics of 0.67Li_2MnO_3-0.33 Li($Mn_{0.375}Ni_{0.375}Co_{0.25}$)O $_2$ Cathode Materials for Lithium Rechargeable Batteries", *215th Electrochemical Society Meeting*, 24–29 May, San Francisco, California, USA.

7. **S. Sivaprakash** and S. Majumder, (2009), "Grain Size Effect on the Electrochemical Properties of Mo Doped Li($Ni_{0.80}Co_{0.2-X}Mo_x$)O_2 (X=0.025) Cathodes for Li Ion Rechargeable Batteries", *International Workshop on Nanotechnology and Advanced Functional Materials*, 9–11 July, NCL Pune, Maharashtra, India.

8. **S. Sivaprakash** and S.B. Majumder, (2010), "Investigation on Highly Potential Layered-oxide Cathode Material for Lithium Rechargeable Batteries", *International Conference in Chemical & Biomolecular Engineering (ChemBiotech 09-10)*, 28–29 January, National University of Singapore, Singapore.

9. **S. Sivaprakash** and S.B. Majumder, (2010), "Investigations On Layered-Oxide Composite Cathode Material For Lithium Rechargeable Batteries", *15th National Convention of Electrochemists*, 18–19 February, VIT University, Tamil nadu, India.

10. **S. Sivaprakash** and S.B. Majumder, (2010), "Structural Investigation on Li($Ni_{0.375}Mn_{0.375}Co_{0.25}$)$O_2$-Li($Li_{1/3}Mn_{2/3}$)$O_2$ Composite Cathode Material for Lithium Rechargeable Batteries", *9th International Symposium on Advances in Electrochemical Science and Technology (ISAEST-9)*, 02–04 December, hotel Green Park, Chennai, Tamil nadu, India.

11. Abhishek Yadav, Jayotpaul Chaudhuri, C. Prabhavathy and **S. Sivaprakash** (2012), "Role of Fillers on Thermal Stability of PVDF Micro-Porous Membranes", *Conference on Technological Advancements in Chemical and Environmental Engineering (TACEE 2012)*, 23-24 March, BITS, Pilani, India.

12. Ranjeet Neve, C. Prabhavathy and **S. Sivaprakash** (2012), "Fabrication and Optimisation of Micro-Porous PVDF Membrane for LithiumIon Rechargeable Batteries, *Conference on Technological Advancements in Chemical and Environmental Engineering (TACEE 2012*), 23-24, March, BITS, Pilani, India.

13. C. Prabhavathy and **S. Sivaprakash** (2013), "SiO_2/ PVDF Coated Separator with Enhanced Thermal Stability for Lithiumion Rechargeable Batteries,*223rd Electrochemical Society Meeting*, May 12-16, 2013, Toronto, Ontario, Canada.

Poster Presentation

1. **S. Sivaprakash** and S.B. Majumder, (2009), "Synthesis and Electrochemical Characterization of $0.5Li_2MnO_3$-$0.5Li(Mn_{0.375}Ni_{0.375}Co_{0.25})O_2$ Cathode Materials for Li Rechargeable Batteries", *2009 MRS Fall Meeting*, 30 November–4 December, Boston, MA, USA.

2. **S. Sivaprakash** and S.B. Majumder, (2010), "Active:Inactive Nano-Composites as High Energy Density Cathode Material for Li-Ion Rechargeable Batteries", *International Conference on Nano Science and Technology*, 17–20 February, Indian Institute of Technology Bombay, Mumbai, India.

3. **S. Sivaprakash** and S.B. Majumder, (2010), "Electrochemical and Structural Investigation on $Li(Ni_{0.375}Mn_{0.375}Co_{0.25})O_2$-$Li(Li_{1/3}Mn_{2/3})O_2$ Composite Cathode Material for Lithium Rechargeable Batteries", *15th International Meeting on Lithium Batteries*, June 27 to July 2, Montrial, Canada.

Invited talk

1. "INAE Young Engineer Award" selection program in Engineering Science for year 2011-2012.

2. "G C Jain Memorial Lecture" in Materials Research Society of India (MRSI) for year 2010-2011.

3. "CSIR Young Scientist Award" selection program in Engineering Science for year 2010-2011 in HRDG, CSIR, New delhi.

4. Young scientists award selection programme 2010-2011 for 98th Indian Science Congress, SRM University.

5. Department of Polymer Engg., Birla Institute of Technology, Mesra, Ranchi-835 215, Jharkhand.

6. Young scientists award selection programme 2009-2010 for 97th Indian Science Congress, Kerala University.

7. Performance Analysis of Synthesised $LiFePO_4$ Cathode Material for Lithium-Ion Batteries, International conference on functional materials (ICFM-2014), Feb 5-7, IIT Kharagpur.

8. Synthesis of Advanced Electrode Materials for Lithium Rechargeable Batteries, Invited talk, Oct 10, NIT Rourkela.

9. Synthesis and Electrochemical Investigation of Mn_3O_4/RGO Composite as Anode Material for Lithium Rechargeable Batteries, India-Taiwan Meeting on Development of Advanced Multifunctional Materials for Electrochemical Energy Devices, Nov 5-6, IISc, Bangalore.

Personal profile

Name as in passport	: Sivaprakash Sundaresan
Date of Birth & Age	: 21-05-1981 & 35
Father's Name	: L. Sundaresan
Nationality & Social Status	: Indian & OBC (Hindu)
Language known	: Tamil (Mother Tongue), English, & Hindi.
Spouse Name	: Prabhavathy, S.

Declaration

I do hereby declare that the particulars of information and facts stated herein above are true, correct and complete to the best of my knowledge and belief.

your's truly

Date: . . . . . .
Place: . . . . . (S. Sivaprakash)