

Mr. Sathiyaraj Kandhasamy

Assistant Professor

Department of Materials Science and Engineering

CARE (Center for Applied Research and Education) group of Institutions

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MOTIVATION

Vibrant learner with self motivated in materials synthesis via innovative routes. Readily reactive in collaboration with interdisciplinary researchers to learn the various research methodologies. Currently, seeking for a Doctoral position in materials research, where I can put together the educational, teaching and research experience for inventing indispensable application.

EDUCATION

- **Master of Technology in Nanotechnology, 2008–2010** (with first class & distinction)
Periyar Maniammai University, Thanjavur, India.
Project: “Synthesis of Nanostructured LiCoO_2 [Layered] and LiMn_2O_4 [Spinel] Cathodes for Lithium Batteries” carried out at Central Electrochemical Research Institute (CECRI), India.
- **Master of Science in Physics, 2006–2008** (with first class & distinction)
Bishop Heber College (Autonomous), Bharathidasan University, Tiruchirappalli, India.
Project: “Laser surface modification on AISI 316L SS coated with SiC-Zr-Ti” carried out at National Institute of Technology (NIT), Trichy, India.
- **Bachelor of Science in Physics, 2003–2006** (with first class)
Thanthai Hans Roever College, Bharathidasan University, Tiruchirappalli, India.

TEACHING EXPERIENCE

July 2012 - Present

Assistant Professor

CARE, India (Dept. Materials Sci. & Engg.)

- Encouraged and molded the young engineers with research interest
- Guided students in designing and executing materials synthesis
- Formulated lab experiments and demonstrated advanced materials characterization
- Handled Characterization of Materials, Bio & Smart Materials and Solid State Physics theory papers
- Motivated researchers to learn the effective utilization of characterization techniques via workshop
- Created awareness about Materials science among the school and under graduate students

RESEARCH EXPERIENCE

Feb 2011- Mar 2012

Occupational trainee Murdoch University, Australia (Dept. Minerals & Energy)

- Synthesized co-doped ($\text{LiMn}_{1/3}\text{Ni}_{1/3}\text{Co}_{1/3}\text{PO}_4$) cathode material and analyzed in aqueous battery
- Studied structural defect by doping with XRD and reported defects influence in cathode property

Jun 2010 – Jan 2011

Research Assistant Periyar Maniammai University, India (DBT project)

- Utilized Atomic Force Microscopy (AFM) to fabricate template for Biosensors
- Developed a setup as replicating AFM for Anodic oxidation and reported its efficiency as publication

Sep 2009 – Jun 2010

Project Student CECRI (CSRI), India (Advance Batteries Department)

- Learned to do systematic literature survey, planning and execution of experiments
- Optimized and executed Hydrothermal synthesis with simple pressure vessel to obtain Nanostructures

FIELDS OF EXPERTISE

- Nanomaterials synthesis via various wet chemical approaches (Publication evident it)
- Materials employability as cathode in Lithium Batteries
- Analysis with suitable characterization techniques and interpreting the results
- Handled Advanced Materials Characterization paper as well as lab

PUBLICATIONS

- Effect of reaction temperature on morphology and electrochemical behavior 2011 *Ionic* 17; 49-59.
- A review on techniques to fabricate silicon oxide arrays to develop biochip 2011 *Superlattice. Microstru.*, 49; 581-590.
- Device for anodic oxidation using copper wire to fabricate oxide dots on silicon 2011 *Microsyst. Technol.*, 17; 1459-1462.
- Poly(N-vinyl-pyrrolidone) assisted sol-gel to derive $\text{LiCo}_{1/3}\text{Mn}_{1/3}\text{Ni}_{1/3}\text{PO}_4$ composite cathode for aqueous rechargeable battery, 2012 *Electrochim. Acta*, 60; 170- 176.
- H_2O_2 aided one-pot hydrothermal synthesis of nano structured LiMn_2O_4 cathode material for lithium batteries, 2012 *IEEE Trans. Nanotechnol.*, 11; 314- 320.
- Role of structural defects in olivine cathodes, 2012 *Prog. Solid State Chem.*, 40; 1-5.

- Utilizing active multiple dopants (Co and Ni) in olivine LiMnPO₄, 2012 *Curr. Opin. Solid State Mater. Sci.*, 16; 163–167.
- Olivine-type cathode for rechargeable batteries: role of chelating agents, 2012 *Electrochim. Acta*, 82; 302–308.
- Influence of sol-gel derived lithium cobalt phosphate in alkaline rechargeable battery, 2012 *J Sol-Gel Sci. Techno.*, 64; 47-53.
- Synthetic strategies for better battery performance through advances in materials and chemistry: Olivine LiMn_{1/3}Co_{1/3}Ni_{1/3}PO₄, 2012 *J Alloys Compd.*, 544; 62- 66.

EVENTS ORGANIZED

- Organized “2 Days Training on XRD & SEM” at CARE group of institutions, Trichy as convener and delivered a technical talk entitled “XRD pattern and Crystal Lattice”

TRAINING UNDERGONE

- UGC sponsored 2 weeks training “NRC-M Summer Workshop on Principles and Techniques of X-Ray Diffraction” at Indian Institute of Science (IISc), India.

WORKSHOPS ATTENDED

- “R&D Proposals to National and International Funding for Research – Approach & Preparation” National Institute of Technology (NIT), Trichy, India.
- “Safety in Science workshop” at Murdoch University, Australia.
- “New Synchrotron and Neutron Users Symposium 2011” at University of New South Wales, Australia.

CONFERENCE PROCEEDINGS

- “Comparing synthetic strategies for better battery performance through materials and chemistry advances” in 10th Spring Meeting of the International Society of Electrochemistry, Perth, Australia.
- “Olivine-type LiNiPO₄ cathode for aqueous rechargeable battery” in 17th AINSE Conference on Nuclear & Complementary Techniques of Analysis & 10th Vacuum Society of Australia Congress, ANU, Australia.
- “Nanometric synthesis of LiMn₂O₄ using hydrothermal method” in National Convention of Electrochemists (NCE-15), VIT University, India.
- “Laser surface modification on SS Coated with SiC-Zr-Ti” in National conference (NMPCD-08), BHC, Trichy, India.

EQUIPMENTS HANDLED

- TGA & DTA
- X-ray diffraction (XRD)
- Spectroscopy (FTIR, UV)
- Microscopy (SEM, TEM, AFM)
- Electrochemistry (Charge-discharge cyclers, CV and EIS)

HONOURS & CREDITS

- Recipient of good department student organizer award (2005-2006) during B.Sc.
- Secured 1st rank in Atomic & Molecular Physics and Analog Circuits & Microprocessor course papers (2006-2007) during M.Sc.
- Served as a Souvenir Editorial Board Member in National Conference on Nano Materials Preparation, Characterization and Devices (NMPCD-08)
- Student member in SPIE - the international society for optics and photonics (2007-2008)
- Best outgoing student (2009-2010)

PERSONAL DETAILS

- Date of Birth : 14 – 04 – 1986
- Status : Married
- Residential Address : B-12, TNHB Colony, Rajiv Nagar, Valajanagaram - po, Ariyalur – 621 704, Tamilnadu, India

REFERENCES

- 1) **Dr. N. Kalaiselvi**, Scientist, ECPS, Central Electrochemical Research Institute, India.
Phone: +91-4565-227550, E mail: kalakanth2@yahoo.com
- 2) **Dr. Manickam Minakshi**, Senior Research Fellow, Faculty of Science and Engineering, School of Chemical and Mathematical Sciences, Murdoch University, Australia.
Phone: +61 (08) 9360 6784, E mail: minakshi@murdoch.edu.au
- 3) **Dr. S. Kumaran**, Prof. (sei) , Dept. of Biotechnology, Periyar Maniammai University, India.
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