

Dr. Thrinathreddy Ramireddy

Centre for Automotive Energy Material (CAEM)

International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

IITM Research Park, 7 th Floor, Section B1

6-Kanagam Road, Taramani,

Chennai-600113.

E-Mail: tr.ramireddy@project.arci.res.in

thrinath87@gmail.com

Phone No: +91-44-66632821

Education

- 2011-2015: **Doctor of Philosophy** in Engineering from **Deakin University**, Victoria, Australia.
- 2008-2010: **Master of Technology** in **Nanotechnology** from **VIT University**, Vellore, Tamilnadu, India.
- 2004-2008: **Bachelors of Engineering** in **Electronics and Communications** from **Prathyusha Institute of Technology and Management** (Affiliated to Anna University), Tiruvellore, Tamilnadu, India.

Experience/Employment History

- 2017- Present: **Project scientist (Middle level)** in **Centre for Automotive Energy Material** at **ARCI**, Chennai, India
- 2016-2017: **Institute Postdoctoral fellow** in **Department of Metallurgical Engineering and Materials Sciences** at **IIT Bombay**, Powai, Maharashtra, India.

Research Area of Interest

- Development of alloy based composite materials and metal oxide as anode materials for metal-ion batteries (Li-ion, Na-ion and K-ion).
- Design and fabrication of cathode materials (polyanion and metal oxide analogue) for various metal-ion batteries.
- Understanding the phase transformations in the electrode during electrochemical cycling using various *In-situ* techniques (Synchrotron powder beam line, EXAFS and Raman).
- Understanding the structural degradation of metallic thin film electrode for various metal ion batteries via *In-situ* stress measurement.
- Safety studies on Li-ion batteries for E-vehicle application.

Major Achievements

- Designed and developed the experimental setup for conducting in-situ experiment using synchrotron powder diffraction beam line at Raja Ramanna Centre for Advanced Technology in Indore, India.
- An energy storage area has been successfully established at Institute for frontier materials, Deakin University.
- Recipient of Deakin University Postgraduate Research (DUPRS) scholarship to pursue my PhD at Deakin University.
- Publication scholarship of \$2000 from the Deakin University towards the preparation of manuscripts.
- A scholarship from CINVESTAV (5,000 Mexican pesos per month) for duration of 9 months to pursue my Master's internship in Mexico.
- Honorary VIT University certificate for being ranked third rank in the department (a prize money of 10,000 Indian rupees was awarded).

Publications

- H.S. Bhardwaj, **T. Ramireddy**, A. Pradeep, M.K. Jangid, V. Srihari, H.K. Poswal, A. Mukhopadhyay, "Understanding the cyclic (in)stability and the effects of presence of stable conducting network on the electrochemical performances of Na₂Ti₃O₇", ChemElectroChem (Accepted) (DOI: 10.1002/celec.201701276)
- I. Sultana, M. M. Rahman, **T. Ramireddy**, Y. Chen, A. M. Glushenkov, "High capacity potassium-ion battery anodes based on black phosphorus", Journal of Materials Chemistry A 2017, 5, 23506-23512.
- **T. Ramireddy**, R. Kali, M.K. Jangid, V. Srihari, H.K. Poswal, A. Mukhopadhyay, "Insights into Electrochemical Behavior, Phase Evolution and Stability of Sn upon K-alloying/de-alloying via In Situ Studies", Journal of The Electrochemical Society 2017, 164 (12), A2360-A2367.
- **T. Ramireddy**, N. Sharma, T. Xing, Y. Chen, J. Leforestier, A.M. Glushenkov, "Size and Composition Effects in Sb-Carbon Nanocomposites for Sodium-Ion Batteries", ACS Applied Materials & Interfaces, 8 (2016) 30152-30164.
- I. Sultana, **T. Ramireddy**, M.M. Rahman, Y. Chen, A.M. Glushenkov, "Tin-based composite anodes for potassium-ion batteries", Chemical Communications, 52 (2016) 9279-9282.
- I. Sultana, M.M. Rahman, **T. Ramireddy**, N. Sharma, D. Poddar, A. Khalid, H. Zhang, Y. Chen, A.M. Glushenkov, "Understanding Structure-Function Relationship in Hybrid Co₃O₄-Fe₂O₃/C Lithium-Ion Battery Electrodes", ACS Applied Materials & Interfaces, 7 (2015) 20736-20744.
- T. Xing, **T. Ramireddy**, L.H. Li, D. Gunzelmann, H. Zeng, W. Qi, S. Zhou, Y. Chen, "Lithium storage in disordered graphitic materials: a semi-quantitative study of the relationship between structure disordering and capacity", Physical Chemistry Chemical Physics, 17 (2015) 5084-5089.

- **T. Ramireddy**, T. Xing, M.M. Rahman, Y. Chen, Q. Dutercq, D. Gunzelmann, A.M. Glushenkov, “Phosphorus-carbon nanocomposite anodes for lithium-ion and sodium-ion batteries”, *Journal of Materials Chemistry A*, 3 (2015) 5572-5584.
- **T. Ramireddy**, M.M. Rahman, N. Sharma, A.M. Glushenkov, Y. Chen, “Carbon coated Na₇Fe₇(PO₄)₆F₃: A novel intercalation cathode for sodium-ion batteries”, *Journal of Power Sources*, 271 (2014) 497-503.
- T. Tao, M.M. Rahman, **T. Ramireddy**, J. Sunarso, Y. Chen, A.M. Glushenkov, “Preparation of composite electrodes with carbon nanotubes for lithium-ion batteries by low-energy ball milling”, *RSC Advances*, 4 (2014) 36649-36655
- **T. Ramireddy**, M.M. Rahman, T. Xing, Y. Chen, A.M. Glushenkov, “Stable anode performance of an Sb-carbon nanocomposite in lithium-ion batteries and the effect of ball milling mode in the course of its preparation”, *Journal of Materials Chemistry A*, 2 (2014) 4282-4291.
- M.M. Rahman, A.M. Glushenkov, **T. Ramireddy**, Y. Chen, “Electrochemical investigation of sodium reactivity with nanostructured Co₃O₄ for sodium-ion batteries”, *Chemical Communications*, 50 (2014) 5057-5060.
- M.M. Rahman, A.M. Glushenkov, Z. Chen, X.J. Dai, **T. Ramireddy**, Y. Chen, “Clusters of α -LiFeO₂ nanoparticles incorporated into multi-walled carbon nanotubes: a lithium-ion battery cathode with enhanced lithium storage properties”, *Physical Chemistry Chemical Physics*, 15 (2013) 20371-20378.
- M.M. Rahman, R.A. Rani, A.Z. Sadek, A.S. Zoolfakar, M.R. Field, **T. Ramireddy**, K. Kalantar-zadeh, Y. Chen, “A vein-like nanoporous network of Nb₂O₅ with a higher lithium intercalation discharge cut-off voltage”, *Journal of Materials Chemistry A*, 1 (2013) 11019-11025.
- M.M. Rahman, A.M. Glushenkov, **T. Ramireddy**, T. Tao, Y. Chen, “Enhanced lithium storage in Fe₂O₃-SnO₂-C nanocomposite anode with a breathable structure”, *Nanoscale*, 5 (2013) 4910-4916.
- **T. Ramireddy**, V. Venugopal, J.B. Bellam, A. Maldonado, J. Vega-Pérez, S. Velumani, M.D.L.L. Olvera, “Effect of the Milling Time of the Precursors on the Physical Properties of Sprayed Aluminum-Doped Zinc Oxide (ZnO:Al) Thin Films”, *Materials*, 5 (2012) 1404

Conferences Attended

- An oral presentation on “Feasibility of alloying-dealloying anode materials for potassium-ion batteries” was presented at **IUMRS ICYRAM (International Conference of Young Researchers on Advanced Materials)**, December 11-15, 2016, Bengaluru, India.
- An oral presentation on “Influence of Sb-C composite ratios on the electrochemical performance and the charge storage mechanism in sodium-ion batteries” was presented at **IUMRS ICYRAM (International Conference of Young Researchers on Advanced Materials)**, December 11-15, 2016, Bengaluru, India.
- An oral presentation on “High precision Al₂O₃ coating on boron nitride nanotubes through ALD deposition technique” was presented at **Australian National Fabrication Facility research showcase**, November 18-19, 2014, Canberra, Australia.

- A poster entitled on “The effect of a ball milling mode on the performance of antimony-carbon composite anode for lithium-ion batteries” was presented at **Materials Research Society conference**, April 21-25, 2014, San Francisco, USA.
- A poster entitled on “Effect of carbon ratio on the electrochemical performance of antimony-carbon composite prepared by ball milling for sodium-ion batteries” was presented at **International Battery Association conference**, March 3-7, 2014, Brisbane, Australia.