

CURRICULUM VITAE

Dr. V.V.N. Phani Kumar
S/o. V.S.R. Seshagiri Rao
Velachery, Chennai.
Email: phanikumar.vaddi@arci.res.in
Mobile: 9003208419 (or) 6374084290

Professional profile:

- Working as a Scientist on cost-effective lithium-ion battery manufacturing for electric vehicle and stationary applications.

Academic qualifications:

- ✓ Ph.D. (2013-2021) from NIT-Warangal, Department of Chemistry.
- ✓ M.Sc (2007-2009) from Andhra University, (First class).
- ✓ B.Sc (2004-2007) from Andhra University, (First class).

Professional Summary:

S.no	Role & Organization	Work focused	Year	Key tasks performed
1.	Scientist (Contract), ARCI	Development of large format LIB cells (LFP/Graphite) for EV applications	2021 to till date	Responsible for slurry mixing, electrode coating, calendaring, slitting, Winding, Electrolyte filling, and moisture determination of electrodes for prismatic and cylindrical cells. Trained the industry personnel on LIB process.
2.	Proj. Scientist-B, ARCI	Development of cylindrical/prismatic cells for LIB applications (NMC/Graphite)	2017 to 2021	Slurry mixing, electrode coating, calendaring, Electrolyte filling, and moisture determination of electrodes for cylindrical cells.
3.	Senior Research fellow, ARCI	Development of aqueous-based electrodes for LIBs	2013 to 2017	Aqueous-based development using LFP, Graphite and LTO materials of LIB.
4.	Project Associate	Synthesis and characterization of LFP material.	2011 to 2013	Synthesis of cathode materials for LIBs and involved in the establishment of the CAEM centre.

5.	Jr. Chemist, ARCH Pharma Labs Limited, Sangareddy.	QC engineer	2010 to 2011	Gas chromatography, Karl-Fischer titrator, pH, Acid-Base titrations, sampling of materials.
----	----------------------------------------------------------------	-------------	-----------------	---------------------------------------------------------------------------------------------

Experience:

- A battery enthusiast in the lithium-ion battery vertical. My core strength is the development of batteries from cell to module level in both cylindrical and prismatic formats. Further, my main interests are in slurry mixing and its properties (Rheology), electrode fabrication, calendaring, moisture content determination, and evaluation/optimization of commercial lithium-ion battery active materials (LFP, NMC532, Graphite, and LTO) respectively.
- Good knowledge on battery testing like Cylindrical, Prismatic, Pouch, and Coin type for LFP/Graphite/NMC cells.
- Handled battery-related projects for the government sector.
- Involved in the establishment of LIB dry rooms and pilot plant equipments.
- Provided both theoretical and practical training and demonstrated the LIB process for industry personnel as part of MoU.
- Guided and supervised the students for the completion of M.Tech, B.Tech and M.Sc projects.

Publication:

Patent:

- 1) A top-lid assembly for a battery cell and a method for producing the top-lid assembly
L. Babu, V.V.N. Phani Kumar, K. Shanmugam, A. Sivaraj, R. Prakash, R. Gopalan, T.N. Rao, (Filed) 2024, **Indian Patent App.No. 202441016527**.

Journal:

- 1) Open-pore type micron-sized lithium iron phosphate cathode using eco-friendly binders for lithium-ion batteries, V.V.N. Phani Kumar, K. Shanmugam, A. Sivaraj, T.P. Sarangan, T. Mohan, Raju Prakash, *ACS Energy&Fuels*, **2024**, (Submitted).
- 2) Electrochemical Strip Sensor Based on a Graphene-Au-PEDOT Nanocomposite for Detection and Continuous Monitoring of Dacarbazine, Rahul P K, Chandan Kafley, Reshmi A Sukumaran, Shekher Kummari, Phani Kumar VVN, Yugender Goud Kotagiri, *ACS Appl. Nano Mater.* **2023**, 6, 18, 16915–16926, **DOI: 10.1021/acsnm.3c03061**
- 3) A novel and sustainable tamarind kernel powder based aqueous binder for graphite anode in lithium-ion batteries, **V.V.N. Phanikumar**, K.V. Gobi, B.V. Appa Rao, R. Gopalan and R. Prakash, *ChemistrySelect* **2020**, 5, 1199–1208, **DOI: 10.1002/slct.201903374**

- 4) Investigation on polyvinyl alcohol and sodium alginate as aqueous binders for lithium titanium oxide anode in lithium-ion batteries, **V.V.N. Phanikumar**, V. R. Rikka, B. K. Das, B.V. Appa Rao, R. Gopalan and R. Prakash *Ionics*, June 2019, Volume 25, Issue 6, pp 2549–2561, **DOI: 10.1007/s11581-018-2751-8**
- 5) Tamarind seed skin derived fiber like carbon nanostructures as novel anode material for lithium-ion battery, **V.V.N. Phanikumar**, S.R. Sahu, R. Prakash, R. Gopalan and B. K. Das *Ionics*, November 2018, Volume 24, Issue 11, pp 3413–3421; **DOI: 10.1007/s11581-018-2498-2**

Awards / Honours

- 1) V.V.N. Phani Kumar received the “**Best Poster Award Certificate**” for presenting a poster on “Investigation of micron-sized lithium iron phosphate as cathode using aqueous binder for lithium-ion batteries” at “National conference on Energy Technologies” conducted by “Indian Institute of Technology Madras”, Chennai during 29-30th April, 2022
- 2) V.V.N.Phanikumar, B.V. Appa Rao, K.V. Gobi, R. Gopalan, and R. Prakash, Tamarind kernel powder as a novel aqueous binder for graphite anode in lithium-ion batteries, December 16- 8, 2019, IIT-Roorkee. (**Best Poster Award**)
- 3) Received the '**Best Poster Award**' for the poster presentation on " Effect of polyvinyl alcohol and sodium alginate aqueous binders on lithium titanium oxide anode for lithium-ion batteries" at National conference on frontiers in chemical sciences and technologies (FCST) held at NIT-Warangal, Warangal during 28 -29th January, 2016.

Conference / Workshop Attended

- 1) V.V.N. Phani Kumar delivered an invited lecture on "Micron-sized lithium iron phosphate as cathode using eco-friendly binders for lithium-ion batteries at 2nd International Meeting on Energy Storage Devices & Industry-Academia Conclave (IMESD-2023), held at IIT-Roorkee during 7-10 December 2023.
- 2) V.V.N. Phani Kumar attended the International Exhibitions & Conferences on 4th Materials Engineering & Technology exhibition and 14th Heat Treatment show at Mumbai during 2-4th November, 2022.
- 3) V.V.N. Phani Kumar delivered a talk on “Synthesis of In-Situ Carbon Coated Lithium Iron Phosphate Using Low-Cost Iron Precursors for Lithium-Ion Batteries at IISC, Bengaluru, for an Indo-French Laboratory of Solid-State Chemistry Workshop (LAFICS) during 3-4th October, 2022.
- 4) V.V.N. Phani Kumar made a poster on “Investigation of micron-sized lithium iron phosphate as cathode using aqueous binder for lithium-ion batteries” at “National conference on Energy Technologies” conducted by “Indian Institute of Technology Madras”, Chennai during 29-30th April, 2022.
- 5) V.V.N.Phanikumar, B.V. Appa Rao, K.V. Gobi, R. Gopalan, and R. Prakash, Tamarind kernel powder as a novel aqueous binder for graphite anode in lithium-ion batteries, December 16- 8, 2019, IIT-Roorkee.

- 6) V.V.N.Phanikumar, B.V. Appa Rao, R.Gopalan and R.Prakash, Polyvinyl alcohol and sodium alginate as alternate green binders of lithium titanium oxide anode for lithium-ion batteries. The 3rd National conference on Materials for energy conversion and storage, 8-20th October, 2018, IIT-BHU, Varnasi.
- 7) National conference on frontiers in chemical sciences and technologies (FCST) held at NIT-Warangal, 28 -29th January 2016, Warangal.
- 8) Oral presentation on Investigation on LiFePO₄/C cathode prepared by eco-friendly polyvinyl alcohol (PVA) binder for lithium-ion battery at NMD-ATM, 13-16th November 2015, Coimbatore.
- 9) One day workshop on “Emerging applications of laser technology in manufacturing” held at VIT University, 13th February 2015, Vellore.

Research Supervision:

- 1) Investigation of micron-sized lithium iron phosphate cathode using aqueous binders for lithium-ion batteries, **D. Sivakumar**, M.Sc (Chemistry Analytical), VIT, April-2023. (Supervisor)
- 2) Optimization of Lithium iron phosphate (LiFePO₄) cathode using aqueous binders by rheological aspects for Lithium-ion Batteries (LIBs), **R. Aravinth**, B.Tech (Chemical engineering), SASTRA University, May-2023. (Co-Supervisor)
- 3) Studies on lithium iron phosphate cathode at different temperatures using aqueous binders for lithium-ion batteries, **T. Pavithra** M. Sc (Materials Science), University of Madras, April-2024. (Supervisor)
- 4) Effects of temperature on lithium Iron phosphate cathode using aqueous binders for lithium – ion batteries, **C. Merlin Benita**, M.Sc (Physics), PSGR Krishnammal college for women, April 2024. (Co-Supervisor)

Contact Information

IIT-M Research Park,
Centre for Automotive Energy Materials (CAEM),
International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI),
7th Floor, 6, Kanagam Road,
Taramani, Chennai- 600113,
Tamil Nadu, India.
Email: phanikumar.vaddi@arci.res.in ; yphani.edu@gmail.com
Mobile: 9003208419 (or) 6374084290
Land line: 044-66632822 (Office).