

BABU L

Technical Officer - C

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Work Experience

April 2015 - till date (9years)

Project scientist B / Technical Officer – C (Jan.2021)

International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Chennai, India

- Development, testing & quality control of lithium-ion battery for electric vehicle and stationary applications
- Cell and cell components design, development and fabrication of components for cylindrical, pouch and prismatic cells
- Cell assembly, battery pack assembly and integration with EV
- Cell formation and validation
- Safety tests and validation (accelerated rate calorimetry)
- Development of laboratory level LIB plant equipment (Slurry mixer to electrolyte filling equipments)
- Supply chain management
- On-road demonstration of e-vehicle
- Technology transfer to cell manufacturer and e-vehicle manufacturer
- Procurement of battery materials and instruments for Li-ion cell fabrication
- Given hands on training of LIB pilot plant equipments for battery manufacturing

July 2004 - March 2015 (10 years 9 months)

Project Sr. Technical Assistant

International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Chennai, India

- Design and development of flow field plates
- Lead a team in PEM fuel cell stack assembly, testing and integration with control system
- Design and fabrication of various PEM fuel cell components such as reactant flow field plate, humidifier, end plate, current collector plate, etc.
- Assembly of control system with PEM fuel cell stack
- Integration
- Testing of multi kilowatts (up to 20kW) PEM fuel cell stack
- Data analysis and interpretation
- Material supply chain
- Development of Methanol based Electrolyzer
- Development of fuel cell stack humidification systems for vehicular applications
- Development of air cooled PEMFC stack for transport application.

May 2001 – July 2002

Machinist (Development of Fuel Cell Technology)

Spic Science Foundation, Chennai

- Fabrication of Bi-polar plates
- Cell Assembly
- Cell testing

Nov. 1995 – April 2001

Project Technician (Department of Physics)

Indian Institute of Technology Madras, Chennai

- Operation and maintenance of ARC melting furnace
- Preparation of magnetic material alloys
- Handling of tubular furnaces and high vacuum pumps

Jan. 1994 – Dec. 1995

Technician Apprentice

TVS Sundaram Clayton Ltd., Chennai

- Quality assurance department

Educational Qualification

Bachelor of Engineering (Mechanical)

CEG campus, Anna University, Chennai

2007- 2010 (62 %)

Diploma in Mechanical Engineering (DME)

Board of Technical education, Tamilnadu, India

1990-1993 (70%)

SSLC

Board of Secondary education, Tamilnadu, India

1990 (63%)

Hands-on Technical Expertise & Skills

Li-ion Battery / cell design, Fabrication and Testing

- Li-ion battery fabrication using pilot plant equipment
- Design, Fabrication of cylindrical, prismatic and pouch cell
- Battery pack assembly
- Charge-discharge, cyclic voltammetry, impedance analysis
- Accelerated rate calorimeter (ARC)
- Battery safety tests (over charge, nail penetration, external short circuit, thermal runaway)
- Fabrication of LIB process equipment for laboratory level
- Fiber Laser welding for hermitical sealing
- Ultrasonic welding

Fuel Cell Technology

- Flow field design drafting, 3D modelling
- Design, development and fabrication of PEM Fuel cell stack components
- Cell assembly
- Integration of other testing devices
- Cell testing
- Data acquisition
- Material supply chain

Computer Program

- AutoCAD, Solid works, Origin, MS-Office, CNC programming
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Major Technological Accomplishments

- Identified Local supply chain for the cell components
 - Design, development and fabrication of cell components
 - Laser welding optimization for hermitically sealing of LIB cylindrical and prismatic cells
 - **Optimized electrolyte amount** and electrolyte **filling conditions** for Li-ion battery
 - **Fabricated In-house electrolyte filling setup for prismatic cells**
 - **Optimized ultrasonic welding parameters** for tab-to-current collector and tab-to-cell casing
 - Fabricated **2.5 Ah cylindrical cells, 10-25 Ah prismatic Cells and up to 25 Ah pouch cells** with LiFePO₄/NMC cathode and graphite anode
 - Assembled **battery pack of 48 V, 1.2 kWh and 48V- 300 Wh**
 - Integrated the battery pack and **demonstrated e-cycle, e-scooter, and solar lamp**
 - **Developed fully automatic Pouch cell stacking machine (up to 50Ah cells)**
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Patents Granted/filed

1. Design and development of PEMFC stack.
D Sangeetha, S Senthil Kumar, Srinivasan Guhan, **L Babu**
Ind. Patent no. 335241
2. An Improved gas flow field plate for use in polymer electrolyte membrane fuel cells.
K.S.Dhathathreyan, N.Rajalakshmi, S.Pandiyan, R.Vasudevan, **L.Babu**, T P.Sarangan, R.Parthasarathy
Ind. Patent No: 332242
3. An improved gas and coolant flow field plate for use in polymer electrolyte membrane Fuel cells.
K.S.Dhathathreyan, N.Rajalakshmi, G. Velayutham, **L.Babu**, R.Vasudevan, T P.Sarangan, R.Parthasarathy
Ind. Patent No: 423285
4. A Process for the incorporation of exfoliated graphite separator plates in Polymer Electrolyte Membrane (PEM) based electrolytic cell for hydrogen generation.
K.S.Dhathathreyan, R.Balaji, K.Ramya, N.Rajalakshmi, **L.Babu**, R.Vasudevan, T.P.Sarangan, R.Parthasarathy.
Ind. Patent No: 366262
5. A top-lid assembly for a battery cell and a method of producing the top-lid
L. Babu, VVN Phani Kumar, K. Shanmugam, A. Sivaraj, R. Prakash, R. Gopalan, Tata Narasinga Rao
Ind. Patent application No: 202441016527