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Professional Experience

- **2006-Present.** Chemist in Chemical Sciences and Engineering Division developing non-platinum bimetallic electrocatalysts for oxygen reduction in fuel cells and corrosion resistant metallic bipolar plates at Argonne National Laboratory (ANL).
- **2002-2006.** Chemist in Chemical Engineering Division developing non-fluorinated aromatic sulfonated polyether dendrionic polymer electrolytes for application as proton transport membranes in hydrogen fuel cells and polymer nanocomposites for barrier films in Lithium-ion battery at ANL.
- **1998-2002.** Research scientist and project leader of Basell's (BASF & SHELL CHEMICALS) Nanocomposite Program.
- **1994-1998.** Scientist, worked on development of supported metallocene catalysts for olefin polymerization at Basell.
- **1990-1993.** Senior research chemist. Worked on development of interloy technology and functional polyolefins at Basell.
- **1987-1990.** Research chemist. Worked on Ziegler-Natta polymerization of olefins at Himont.
- **1985-1987.** Visiting scientist at the Institute of Polymer Science, The University of Akron; Akron, Ohio. Developed fluorinated olefin copolymers via free radical polymerization. Worked on NMR characterization.
- **1983-1985.** Research Officer, Indian Petrochemicals Industries Ltd., Economic utilization of Atactic Polypropylene.
- **1979-1983.** Visiting Scientist, Institute of Polymer Science, The University of Akron; Akron, Ohio. Developed transfer-free cationic polymerization of substituted olefins and new block and graft copolymers.
- **1974-1979.** Worked as a scientist at different organizations and Universities in India and Europe.

Education

- Ph.D., Polymer Chemistry, University of Calcutta, 1973.

Career Activities & Selected Highlights

- Developed conductive coating materials for metallic bipolar plates, patent filed. The concept was submitted for funding and has been awarded.

- Developed polypropylene nanocomposites with organophilic clays prepared from novel surfactants and process technology, patent issued.
- Provided technical support for patent on Dendritic Polymer membranes. Prepared dendrionic polymer electrolytes by grafting reactions between polyether dendrons and a flexible matrix polymer. Evaluated their stability and conductivity. Later on, replaced polyether dendrons with alternative and more stable aromatic sulfonic acids.
- Developed process for highly active Pd-Cu bimetallic supported catalysts in co-operation with members of the non-platinum bimetallic catalyst development group.
- Developed a breakthrough in polyolefin technology, customized the preparation of nanocomposites. Three fundamental patents have been issued.
- Introduced a competitively superior composite formulation with nearly 30 percent cost reduction
- Developed value added polyolefin technology in the form alloy for a 200 million pound realizable market. This was later sold to Crompton Industries. Also patented new polyolefin blends for engineering applications.
- Steered a multidisciplinary team in refining a commercial process for polyolefin modification and provided leadership, monitored progress, took corrective actions, reduced formulation cost with 20 percent overall cost saving with improved material performance.
- Introduced thermally stable polyolefin blends for high heat applications and developed proprietary low cost flame retardant thermoplastic polyolefins.
- Created new business through direct customer interactions and business function, consulted for customers in applications and quality control.
- Developed stable polyolefin emulsions for coating applications.
- Invented and patented flexible epoxy resins.
- Successfully demonstrated new methodology to prepare thermoplastic elastomers.

Publications & Patents

- Patents: 13
- Publications in Research Journals: 34
- Technical Reports: 37