

SPECIAL LECTURE

Solid State Chemistry of Fast Ion Conductors



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Department of Physics, Pondicherry University

By

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Abstract of the lecture

Solid-state materials exhibiting fast ionic conduction are being considered for application in solid oxide fuel cells (SOFCs), proton exchange membrane fuel cells, batteries and capacitors. Rechargeable lithium-ion batteries (LIBs) have received much attention due to their high volumetric and gravimetric energy densities and their wide range of applications. Currently employed organic polymer electrolytes in LIBs have several disadvantages such as flammability, and poor electrochemical stability. Recent research on electrolytes for LIBs has been focused on developing thermally and electrochemically stable solid electrolytes with desired physical and chemical properties. Several inorganic electrolytes, including beta-alumina, NASICON, LISICON, perovskite, and garnet-type materials are being developed for solid-state Li batteries. Here, we report advanced ceramic electrolytes, based on garnet-type oxides, for application in solid-state Li batteries together with designing aspects of useful solid electrolytes and electrodes.

Biography

Dr. Venkataraman Thangadurai is full professor of chemistry at the University of Calgary, Canada. He is a Fellow of the Royal Society of Chemistry, United Kingdom. He received his PhD from the Indian Institute of Science, Bangalore, India in 1999 and did his PDF at the University of Kiel, Germany. He received a prestigious PDF fellowship from the Alexander von Humboldt Foundation, Bonn, Germany. In 2004, Dr. Thangadurai received his Habilitation degree from the University of Kiel. His current research activities include discovery of novel ceramic membranes and mixed ion and electron conductors for all-solid-state-Li batteries, solid oxide fuel cells, solid oxide electrolysis cells, and electrochemical gas sensors. He has published >150 scientific papers in international refereed journals. In 2016, he received the prestigious Keith Laidler Award from the Canadian Society of Chemistry for his outstanding contributions to physical chemistry.

Head, Dept. of Physics