

## SELECTED PUBLICATIONS

X. Han, Y. Gong, K. Fu, X. He, G. T. Hitz, J. Dai, A. Pearse, B. Liu, H. Wang, G. Rubloff, Y. Mo, V. Thangadurai, E. D. Wachsman and L. Hu, "Negating interfacial impedance in garnet-based solid-state Li metal batteries", *Nature Materials*, 16, 572-579 (2017).

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S. Narayanan, F. Ramezanipour, and V. Thangadurai, "Dopant Concentration - Porosity-Li-Ion Conductivity Relationship in Garnet-Type  $\text{Li}_{5+2x}\text{La}_3\text{Ta}_2-x\text{Y}_x\text{O}_{12}$  ( $0.05 \leq x \leq 0.75$ ) and Their Stability in Water and 1 M LiCl," *Inorg. Chem.*, 54(14), 6968-6977 (2015).

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B. Mirfakhraei, F. Ramezanipour, S. Paulson, V.I. Birss and V. Thangadurai, "Effect of Sintering Temperature on Microstructure, Chemical Stability and Electrical Properties of Transition Metal or Yb-Doped  $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.1}\text{M}_{0.1}\text{O}_{3-\delta}$  (M = Fe, Ni, Co and Yb)," *Front. Energy Res.*, 2, 1-10 (2014).

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# ABSTRACT

Ceramics exhibiting fast proton, oxide ion, lithium ion and mixed ionic and electronic conduction are being considered for alternative energy conversion devices, including solid oxide fuel cells (SOFCs), proton conducting SOFCs, and storage devices, including batteries and electrolysis cells. The functional properties of ceramics depend on nature of chemical species present.

Large numbers of inorganic compounds and organic polymers show fast ionic conduction, while not all of them find application in practical devices. The key requirements for useful ceramic electrolytes are high ionic and negligible electronic conductivity over the employed range of activity of the mobile species, and chemical stability against reaction with the adjacent cell components. These remain challenging for scientists to develop durable solid-state ionic devices with high power density. In this talk, current development of advanced ceramics for all-solid-state Li ion batteries and SOFCs will be presented.

# DR. VENKATARAMAN THANGADURAI

Dr. Venkataraman Thangadurai is a full professor of chemistry at the University of Calgary. He is a Fellow of the Royal Society of Chemistry, UK. He received his BSc from Sacred Heart College in Tirupattur, India in 1989 and his MSc from Muthurangam Government Arts College in Vellore, India in 1991. 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, he received his Habilitation degree from the University of Kiel before starting his independent career in Calgary in 2005. In 2016, he received the prestigious Keith Laidler Award from the Canadian Soc. of Chemistry for his outstanding contributions to physical chemistry. His current research activities include the discovery of novel ceramic membranes and mixed conducting electrodes for Li batteries, solid oxide fuel cells, solid oxide electrolysis cells, and gas sensors.

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