UNDERWRITERS LABORATORIES®

Battery Safety Science Symposium

August 11, 2021

Session II
Novel Electrode Materials: The Future

Dr. Arumugam Manthiram
Professor
Walker Department of Mechanical Engineering
McKetta Department of Chemical Engineering
Materials Science and Engineering Program & Texas Materials Institute
The University of Texas at Austin

Sustainable Next-generation Battery Chemistries

A widespread adoption of battery technologies for electric vehicles and grid electricity storage of renewable energies requires optimization of cost, cycle life, safety, energy density, power density, and environmental impact, all of which are directly linked to severe materials challenges. After providing a brief account of the current status, this presentation will focus on the development of advanced materials and next generation of battery technologies, with near-term and long-term perspectives. Particularly, lithium-based batteries based on cobalt-free layered oxide and sulfur cathodes will be presented. The challenges of cycle and thermal instability and safety, advanced characterization methodologies to develop an in-depth understanding, and approaches to overcome the challenges will be presented.

About the speaker

Dr. Arumugam Manthiram is the Cockrell Family Regents Chair in Engineering and Director of the Texas Materials Institute at the University of Texas at Austin (UT-Austin). After receiving his Ph.D. in chemistry from Indian Institute of Technology Madras in 1981 and working as a postdoctoral researcher at the University of Oxford and at UT-Austin, he became a faculty member at UT-Austin in 1991. His research is focused on batteries and fuel cells. He has authored 850 journal articles with 77,000 citations and an h-index of 138. He has mentored 265 students and postdoctoral researchers, including the graduation of 65 Ph.D. students.

Dr. Manthiram is a Fellow of Materials Research Society, Electrochemical Society, American Ceramic Society, Royal Society of Chemistry, American Association for the Advancement of Science, and World Academy of Materials and Manufacturing Engineering. He is an elected member of the World Academy of Ceramics. He received the university-wide (one per year) Outstanding Graduate Teaching Award in 2012, Battery Division Research Award from the Electrochemical Society in 2014, Distinguished Alumnus Award of the Indian Institute of Technology Madras in 2015, Billy and Claude R. Hocott Distinguished Centennial Engineering Research Award in 2016, Honorary Mechanical Engineer of the ME Academy of Distinguished Alumni Award in 2019, Henry B. Linford Award for Distinguished Teaching from the Electrochemical Society in 2020, and the International Battery Association Research Award in 2020. He is a Web of Science Highly Cited Researcher every year since 2017. He delivered the 2019 Chemistry Nobel Prize Lecture in Stockholm on behalf of Professor John Goodenough.