

Carnegie Mellon

Materials Science and Engineering Seminar Series

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Materials Science and Engineering Program
& Department of Mechanical Engineering
The University of Texas at Austin

“Challenges and Opportunities of Lithium Ion Battery Technology”

Friday, September 17, 2010
10AM Seminar in Baker Hall 136A

Lithium-ion batteries have revolutionized the portable electronics market, but their adoption for transportation and stationary electrical energy storage applications is hampered by high cost and safety concerns. The success of lithium-ion technology for these applications relies heavily on the development of low-cost, safe cathode and anode materials with high energy and power densities as well as long cycle life. After providing an overview of the pros and cons of the existing cathode and anode materials, this presentation will focus on the (i) development of high-capacity, high-power layered and spinel oxide cathodes, (ii) low-cost manufacturing of nanostructured olivine phosphate cathodes, and (iii) design of nano-engineered alloy anodes. Particularly, the advantage of surface modification of cathodes and anodes with nanostructured materials in enhancing the energy and power will be emphasized.

Dr. Manthiram graduated from Madurai University, India, with a B. S. in 1974 and a M. S. in 1976, both in chemistry. He received his Ph.D. in chemistry from the Indian Institute of Technology, Madras, in 1980. He joined the University of Texas at Austin in 1986 and currently holds the Joe C. Walter Chair in Engineering in the Materials Science and Engineering Program and Department of Mechanical Engineering. Dr. Manthiram directs a large research group in electrochemical energy technologies, focusing on the development of new materials for lithium-ion batteries, fuel cells, and supercapacitors. Dr. Manthiram has authored close to 400 publications, including 300 archival journal articles, and holds 7 patents.