THERMAL MANAGEMENT AND SAFETY CONCERNS FOR LI-ION BATTERIES IN ELECTRIC MOBILITY AND AUTONOMOUS VEHICLES APPLICATIONS

Said Al-Hallaj, PhD
CEO, AllCell Technologies, LLC
Visiting Research Professor of Chemical Engineering
University of Illinois at Chicago

Abstract:

Lithium-ion (Li-ion) battery technology is emerging as the energy storage technology of choice for electric mobility, autonomous vehicles and smart grid applications due to its high energy density, higher power density, long cycle life, and steady cost reduction. However, recent and persistent high-profile safety incidents (e.g. Tesla vehicles, Samsung smart phone, Boeing 787 Dreamliner) are posing serious concerns about the inherent safety of Li-ion batteries and could hinder future growth of this critical energy storage technology. Alternative technologies such as solid state and "beyond lithium" batteries are promising but are still in the early stage of development and are not expected to replace Li-ion batteries in the near future. An overview of Li-ion battery safety and thermal management challenges will be presented. Passive thermal management of Li-ion batteries using phase change composites (PCC) technology will be discussed as an alternative solution compared to conventional thermal management technologies.

About the Keynote Speaker:

Said Al-Hallaj is the CEO and co-founder of All Cell Technologies LLC, and a Research Professor of Chemical Engineering at the University of Illinois at Chicago (UIC). Dr. Al-Hallaj earned his B.Sc and M.Sc in Chemical Engineering from Jordan University of Science and Technology (JUST) and a Ph.D in Chemical Engineering from the Illinois Institute of Technology (IIT). Said co-authored a book entitled "Hybrid Hydrogen Systems" and has published several book chapters and numerous number of peer reviewed and conference journal papers. Said is the co-inventor of several issued and pending patent applications in the areas of renewable energy, energy storage and water desalination.