

Electrolyte and Advanced Electrode Materials for Commercial Li-Ion Batteries

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Stronger emphasis on sustainability has become a necessity amongst all industries, and the automotive industry is no exception. The push to move toward hybrid electric vehicles (HEVs) and electric vehicles (EVs) has resulted in a need for lithium ion batteries delivering higher power over a wide temperature range with improved safety over a long lifetime. To accomplish these requirements, advanced electrode materials such as the high nickel cathode material $\text{LiNi}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1}\text{O}_2$ (NCM811) or the anode material $\text{Li}_4\text{Ti}_5\text{O}_{12}$ (LTO) have been sought after. The high nickel cathode materials come with the desired high capacity suitable for the power needed for automobile applications but comes with safety and cycle life troubles. Looking at the other electrode LTO comes with long cycle life and improved safety compared to the widely used graphite anode but has gassing and capacity setbacks. During this seminar presentation, a deeper look into the industry of lithium ion batteries as well as a review of work focusing on the electrolyte influence on these advanced anode and cathode materials will be discussed.