

Advanced electrolytes for high-energy-density batteries

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Solar energy, wind power, tidal power, and nuclear power are mentioned as the next generation energy, but it is difficult to use these kinds of energy for transportation such as vehicles due to their uneven energy production. From this perspective, the interest in energy storage technology is on the rise as a means to solve this problem. It is believed that commercially available Li-ion batteries (LIBs) are the most feasible alternatives from the viewpoint of current technical maturity and economic consideration. Although LIBs were successfully commercialized, a noticeable improvement in power and energy density of Li-ion cells is required to satisfy needs for high power and/or capacities for applications such as power tools, electric vehicles or efficient use of renewable energies.

In this presentation, I will highlight recent advancements in functional organic electrolytes that can provide a solution for long-lasting batteries without sacrificing energy density. The interfacial engineering of electrode materials by electrolyte additives offers great promise for high-energy-density batteries.