A New Series of Ni-Rich Layered Cathodes for Next Generation Electric Vehicles

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Li-ion batteries (LIBs) have been positioned as the main portable energy source for electric vehicles (EVs) based on their high energy densities, high power densities, and practical cycle lives. The increasingly strong demand for the higher energy density of LIBs has pushed the development of high-capacity cathodes. The specific capacity of Ni-rich cathodes increases with the Ni content, but the capacity gain from Ni enrichment is negated by the fast capacity fading. One of the effective methods is to control the microstructure of primary particles, such as an elongation of the primary particles with radial orientations. In this presentation, the changes in morphology and microstructure of Ni-rich NCM and NCA cathodes are introduced. This microstructural modification significantly improves cycling stability by suppressing the formation of microcrack.