



### Conformal coating of LTO/PAN for high performance Si nano-composite anodes

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Silicon is a potentially promising anode material for the next-generation energy storage devices owing to advantages as low cost, low toxicity and high specific capacity. However, there are several disadvantages of the silicon that shorten the life time of the battery such as instability of SEI layer, low electrical conductivity and volume change [1]. Huge volume expansion (>300%) during the lithiation/delithiation processes, which results in the pulverization of Si particles and fast capacity loss of the anode material, is considered as a major problem [2]. To be implemented commercially Si nanoparticles should exhibit high-power and low volume change. So far, there have been no credible Si-based materials reported satisfying all of these requirements [3]. Here, we report modified Si nanoparticles co-coated with  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  and cyclized polyacrylonitrile targeted to enhance the conductivity and tolerance to volume change. The synergistic effect from both coating provide the Si electrode with good conductivity and better performance. Synthesized Si/LTO/cPAN composites were characterized by X-ray diffraction (XRD) and Scanning electron microscopy (SEM) to identify the structure and morphology of composites.

**Key words:** coating, Si nanoparticles, Si/LTO/PAN composite.

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