

The synthesis of SiO_x nanowire materials

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Abstract

In our life, The electrical devices give us more & more comfortable life. Batteries extend the limit of the locations of these electrical devices. Lithium-ion batteries (LIBs) are mainly used for the portable electronic devices (for example, notebook, smart cell phones, electrical motorcars, energy storage devices) with more high capacities or high energy densities.

There are many materials had been used to as alternatives to the conventional graphite anodes in order to meet the usage requirements. Si is a promising electrode material for its highest theoretical capacity, abundance, low cost and environmental friendliness. But micro-sized Si particles are with low electrical conductivity. Nanostructured Si-based materials have been studied as an effective solution with high cost, low packing density.

So we combine a thermal disproportionation of SiO with a metal-catalyzed Si nanowire growth, in which bulk SiO particles are converted into the Si/SiO_x nanowires in the core regions of the SiO. The Si/SiO_x nanowires can be available in many applications. For example, the scalable approach of interconnected Si/SiO_x nanowires renders it a promising candidate for high capacity anodes in LIBs.

Keywords – LIBs, Anode, Si/SiO_x nanowire