

## CeO<sub>2</sub>-decorated CNT particles for high-performance Li-S batteries

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Lithium-sulfur (Li-S) batteries are attracting attention as a promising next-generation energy storage devices. Sulfur loaded in the porous carbon as the cathode is preferred because of its high utilization of the active material during charging and discharging. Here we demonstrate the utilization of micro-sized sulfur in the open pore CNT porous particle. We form micro-sized sulfur on CNTs by partial spontaneous dewetting. We load CeO<sub>2</sub> to promote the conversion kinetics of the active material. Our micro-sized sulfur-loaded CNT-based cathodes promote fast kinetics of the conversion and the high utilization of the active material, especially at high C-rate. The cathodes achieve excellent cycle ability in condition of high C-rate (initial capacity 827mAh/g and 719mAh/g after 300 cycles at 2C), even with high areal sulfur loading. Our CeO<sub>2</sub>/CNTP presents simple and low-cost way to reach high performance the batteries.