N-doped MnO₂ Nanospheres as Cathode Materials for Long Cycle Performance Lithium-Sulfur Batteries

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N-doped MnO₂ nanospheres (NMON) are prepared and developed as the cathode materials for the lithium-sulfur batteries. First, the pristine MnO₂ nanospheres are synthesized via hydrothermal reaction method. After that, N-doping process is achieved by heating pristine MnO₂ nanospheres (PMON) under N₂ atmosphere. Finally, NMON/S composites are prepared as cathode materials. To investigate the electrochemical performance, coin batteries are assembled and tested by using the NMON/S composites as cathode materials. The electrochemical results indicate that the initial specific capacity is as high as 1118 mAh g⁻¹ at 0.2 C for the NMON/S composites. The capacity of NMON/S composites remains at 810 mAh g⁻¹ at 1 C after 500 cycles.

Keywords: Lithium-sulfur batteries, NMON/S composites, N-doped, Electrochemical performance, Cycle stability

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