Preparation and characterization of the sulfur-carbon nano-composite material for Li/S battery

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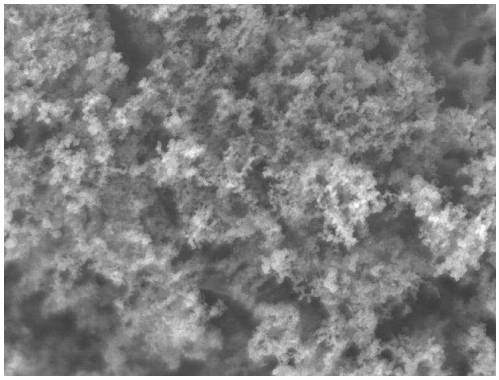

Fig. 1 SEM image of S-C composite material

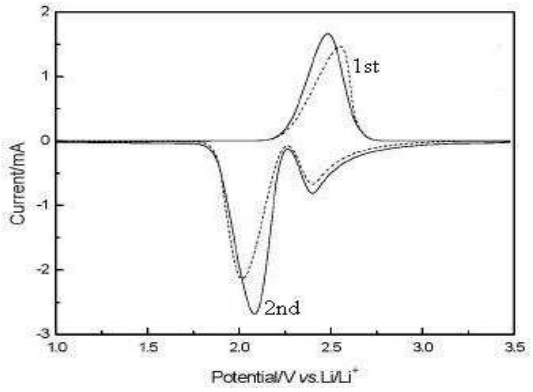

Fig. 2 Cyclic voltammogram of Li/S cell

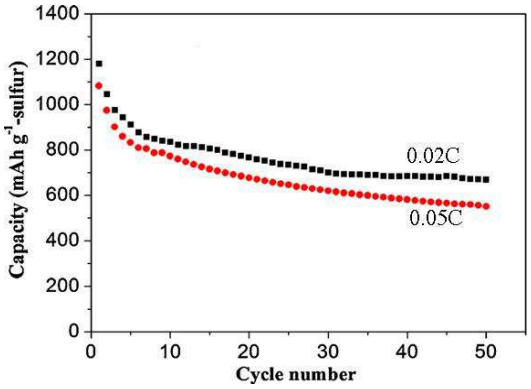

Fig. 3 Cycling performance curves of Li/S cell

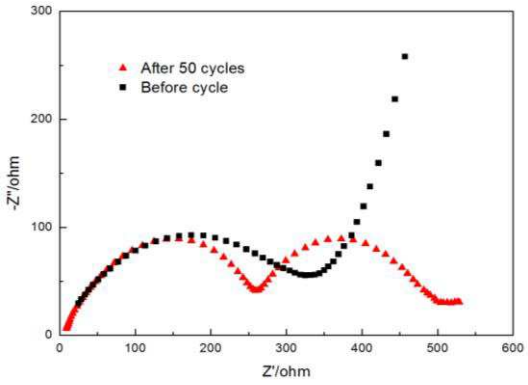

Fig. 4 EIS plots of Li/S cell

The sulfur-carbon (S-C) nano-composite material have been prepared by a simple chemical deposit method in an aqueous solution. The composite material was characterized by scanning electron microscopy, energy dispersive spectrometer, and differential scanning calorimetry-thermo gravimetric analysis. The electrochemical performance of the S-C cathode made of the composite material was studied by cyclic voltammetry, charge-discharge test, and electrochemical impedance spectroscopy. It is found that the sulfur particles in prepared S-C composite material have a sphere-like morphology with the size of around 20~30nm, and distribute uniformly around the carbon particles. The initial specific capacity of the S-C cathode in Li/S battery can reach to 1200mAhg^{-1}, and retains at 700mAhg^{-1} after 50 cycles.

References

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