

Synthesis of P-doped meso-microporous core-shell carbon by hard templating method

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The rechargeable batteries are in high demand to address increasing electric devices market. Li-ion batteries get the possession because of its high energy density and lightness, but it's hard to use for electric vehicles and ESS due to its low capacity. So many researches are under way for alternative batteries. Among them, Li-S batteries have attracted much attention for it has high capacity and use low-cost active materials compared to Li-ion batteries. However the active material, sulfur dissolves as polysulfides intermediates while charging and discharging. This makes the capacity decrease and followed by poor cycle performance. So we tried to design new cathode materials that can block the elution of polysulfides by making microporous carbon layer. In our study, we synthesized phosphorus doped meso-microporous core-shell carbon by nanocasting and coating method. Rod-type SBA-15 silica was used as hard template. Herein, we controlled the amount of phosphoric acid and thickness of coated carbon. The as-synthesized materials were characterized by X-ray diffraction(XRD), N₂-sorption isotherm and scanning electron microscope(SEM).