Porous Si@C Composite Anode Material Prepared Using Dopamine as a Carbon Source for High-Performance Lithium-Ion Batteries

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Porous silicon-carbon (Si@C) composites as anode materials for Li-ion batteries are considered to be the most effective material for solving the problem of poor cycling performance of conventional silicon anode materials. However, the preparation process is complex and there are still some defects and shortcomings from the carbon source that limit its further application. Herein, we demonstrate a method through the self-polymerization of dopamine to produce Si@C composite anode materials with core-shell structures. The preparation process is simple, and the raw materials are environmentally friendly and do not cause pollution. The experimental results show that the material has good cycling stability, rate capability and an initial Coulombic efficiency of 87.7%. This provides a new idea for the application of Si@C composite anode materials.

Keywords: Li-ion battery, Porous Si, Carbon coating, electrochemical properties.

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