Disodium Rhodizonate/Reduced Graphene Oxide-Sodium Alginate Composite as a Cathode Material for Sodium-ion Batteries with High Cyclic Performance

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Organic electrode materials have great application potential in sodium-ion batteries, but solving the cycling performance of organic materials at high current densities is a huge challenge. Here, Na₂C₆O₆/reduced graphene oxide-sodium alginate (SR/RGO-SA) was prepared by antisolvent precipitation and solvothermal methods. The hydrogen bonds formed between SR and RGO-SA and the conductive network of RGO-SA were used to prevent the capacity attenuation caused by pulverization upon prolonged cycling. Versus SR electrodes, the SR/RGO-SA electrode has better cycle performance and rate performance at high current densities. The SR/RGO-SA cathodes (7 : 3) show high specific capacity (157.2 mAh g⁻¹ at 500 mA g⁻¹ rate, 0.5–3.2 V) after 100 cycles. This modification method improves cycling performance by improving organic electrode materials.

Keywords: sodium-ion battery; disodium rhodizonate; reduced graphene oxide; sodium alginate; cathode material

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