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Synthesis and characterization of CuO/graphene (Core/shell) quantum dots for electrochemical applications

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ABSTRACT

We report on the in-situ chemical growth of unique core-shell quantum dots (QDs) with single layer graphene on the surface of CuO QDs and their structural, optical and electrical properties. The CuO/graphene QDs were synthesized through a simple and hydrothermal technique. In order to enhance performance electrochemical energy storages, we have developed core (active material)/shell (conductive material) type CuO/graphene QDs as electrode materials using the combined electrolytes (KOH+LiCl). As a result, the performance of electrochemical energy storages exhibits specific capacitance of 154 F g⁻¹ at current density of 1 A g⁻¹ and cycling stability with 84% capacitance retention after 3,000 cycles.

KEYWORDS

Quantum dots, CuO, Graphene, Core/shell type, Electrochemical, Supercapacitor

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