

Graphene quantum dots/Ni(OH)<sub>2</sub> nanocomposites on carbon cloth as a binder-free electrode for supercapacitors

류적, 김소음, 최원묵<sup>†</sup>

울산대학교

(wmchoi98@ulsan.ac.kr<sup>†</sup>)

Graphene quantum dots (GQDs)/Ni(OH)<sub>2</sub> composites on carbon cloth (G-NH/CC) are prepared through simple hydrothermal reactions. The resulting G-NH/CC is employed as a binder-free electrode of supercapacitors. Due to the enhanced electrical conductivity and efficient ion transport by the addition of GQDs, the G-NH/CC electrode exhibits enhanced electrochemical performances. Specifically, the G-NH/CC delivers a maximum specific capacitance of 1825 F•g<sup>-1</sup> at a current density of 1 A•g<sup>-1</sup> as well as a good cycle stability of 83.5% capacity retention after 8000 cycles. Additionally, all-solid-state symmetric supercapacitor (SSC) is assembled with G-NH/CC composites as both positive and negative electrodes. The fabricated SSC exhibits a high energy density of 80.8 Wh•kg<sup>-1</sup> at a power density of 2021 W•kg<sup>-1</sup>. The present study provides a facile and efficient strategy to prepare high-performance electrode materials for advanced electrochemical energy storage devices.