

Flexible asymmetric supercapacitors using g-C<sub>3</sub>N<sub>4</sub> quantum dots and MnCO<sub>3</sub> on carbon cloth electrode

류적, 김소음, 최원목<sup>†</sup>  
울산대학교  
(wmchoi98@ulsan.ac.kr<sup>†</sup>)

Numerous efforts have been made to investigate manganese carbonate as active materials in the field of energy storage. To explore the full use of MnCO<sub>3</sub> for supercapacitor in aqueous electrolyte, a facile hydrothermal method was developed to synthesis g-C<sub>3</sub>N<sub>4</sub> quantum dots/MnCO<sub>3</sub>/carbon cloth composites (q-MC//CC) as a binder-free electrode. With the adding C<sub>3</sub>N<sub>4</sub> quantum dots in MnCO<sub>3</sub>, the superior electrochemical performance was achieved, including high capacitive properties of 1001.9 F/g at 1 A/g and a good cycling stability of 96% retention after 5000 cycles. In addition, an asymmetric supercapacitor with a-MC//CC as positive electrode and CC as negative electrode yielded a high energy density of 27.1 Wh/kg at a power density of 500 W/kg. The synthetic strategy provides a fine reference for metal carbonate structures and the results indicate that q-MC//CC electrode can be a promising material for energy storage applications.