

### Evaluation of electrocapacitive performance of graphene-based supercapacitors

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Graphene-metal oxide composite was synthesized and its electrocapacitive characteristics were investigated for the application to supercapacitor electrode. Graphene has the great advantage over the other carbon based-materials because of very large surface area (2630 m<sup>2</sup>/g), when graphene sheets are perfectly exfoliated to produce mono-layered graphene. However it is not easy to obtain completely exfoliated graphene sheets due to their Van der Waals force.

In this study, metal oxide was inserted to prevent the restacking of graphene sheets. Morphologies of pristine graphene and graphene-metal oxide composite were studied by SEM and TEM analyses. TGA and particle size analyzer were used to measure the physical properties. And electrochemical characteristics were examined by means of cyclic voltamogram (CV) and electrochemical impedance spectroscopy (EIS). Accordingly, electrocapacitive performances of pristine graphene and graphene-metal oxide composite were compared.