



Two-Dimensional Core-Shell Structure of Cobalt-Doped@MnO₂ Nanosheets Grown on Nickel Foam as a Binder-Free Battery-Type Electrode for Supercapacitor Application

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1. Materials and reagents

All the chemicals of analytical grade were used as received without further purification. Manganese chloride hexahydrate (MnCl₂·4H₂O, 99.1%, Sigma Aldrich, St. Louis, MO, USA), Cobalt nitrate hexahydrates (Co(NO₃)₂·6H₂O, 99.2%, Sigma Aldrich), and urea (CH₄N₂O, 99.1%, Sigma Aldrich) were purchased from Sigma Aldrich, Korea. Ni foam has received from Japan. potassium hydroxide (KOH, 99.99%), Hydrochloric acid (HCl, 99.2%), and sodium hydroxide (NaOH, 99.8%) were purchased from Samchun Chemicals, Korea. Ni foam with a 1.6 mm thickness was purchased from Alantum, Korea. De-ionized (DI, 100%) water and double-distilled water (DDW, 100%) were used especially for the purposes of preparing solutions and washing.

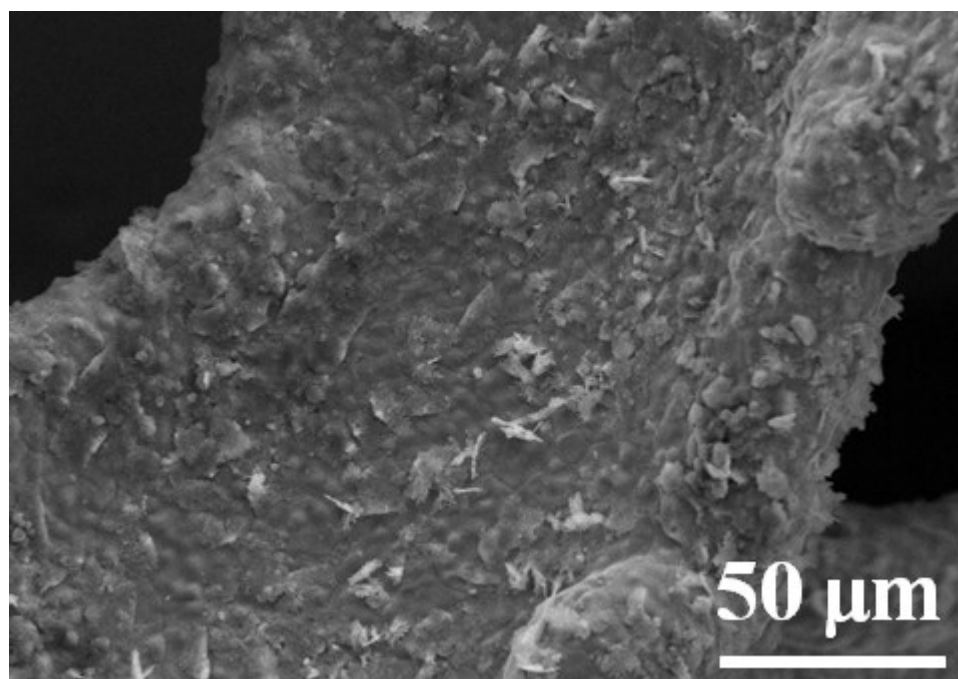


Figure S1. SEM image of cobalt-doped@MnO₂ nanosheets well distributed on nickel foam.

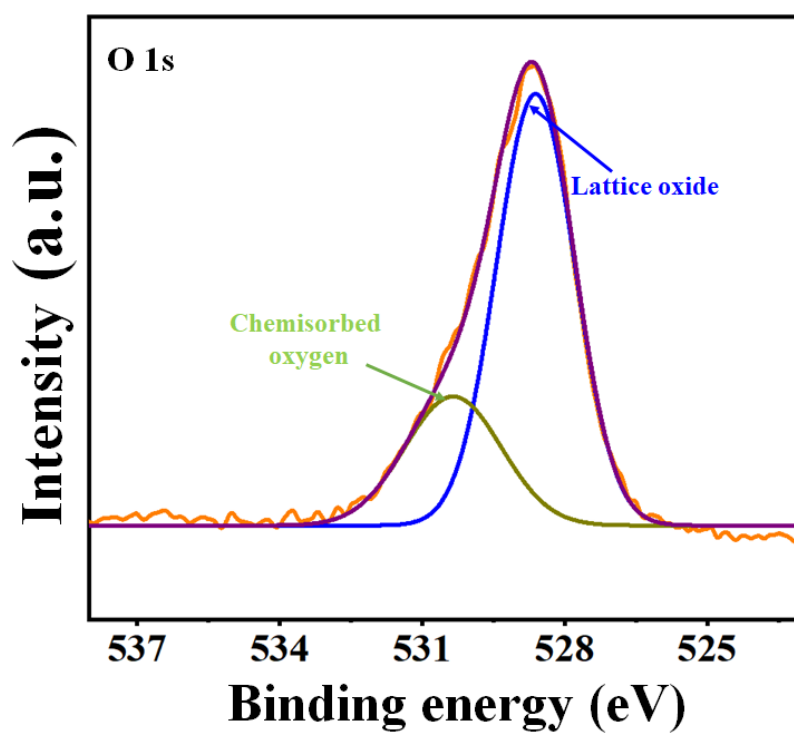


Figure S2. O 1s XPS spectrum of cobalt-doped@MnO₂ nanosheets composite.

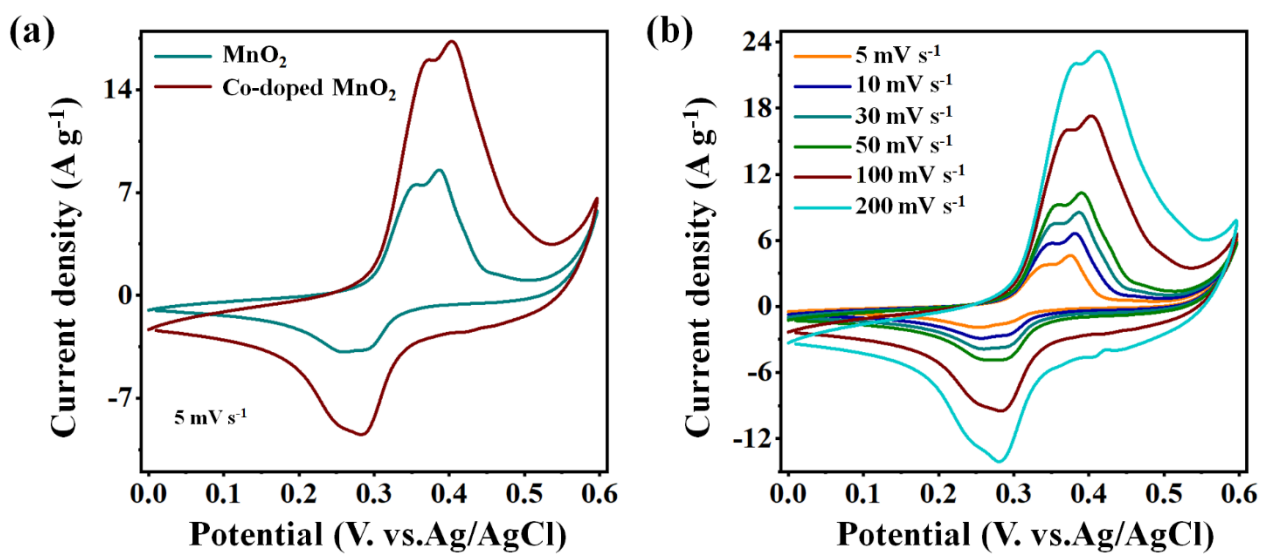


Figure S3. (a) CV comparison of MnO_2 and cobalt-doped MnO_2 nanosheets composite electrode materials and (b) CV curves of MnO_2 sample.