

## Characterization Of $\text{MgCo}_2\text{O}_4$ As An Electrode For High Performance Supercapacitors

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### ABSTRACT

Metal cobaltites have promising electrochemical properties for their application as an energy storage medium. In this paper, usefulness of  $\text{MgCo}_2\text{O}_4$  as a supercapacitor electrode is demonstrated and compared its performance with two other cobaltites,  $\text{MnCo}_2\text{O}_4$  and  $\text{CuCo}_2\text{O}_4$ . The materials are synthesized using molten salt method and characterized by X-ray diffraction, scanning electron microscopy, BET surface area, cyclic voltammetry, galvanostatic charge–discharge cycling, and electrochemical impedance spectroscopy techniques. The  $\text{MgCo}_2\text{O}_4$  electrodes show superior charge storage properties in 3 M LiOH among a diverse choice of electrolytes. The  $\text{MgCo}_2\text{O}_4$  show higher theoretical ( $\sim 3122 \text{ F/g}$ ) and practically achieved capacitance ( $\sim 320 \text{ F/g}$ ), larger coulombic efficiency, and cycling stability than the other two; therefore, it could be developed as a low-cost energy storage medium.

**KEYWORDS:** Electrochemical energy storage; Pseudocapacitors; Asymmetric capacitors; Lithium ion battery

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