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RGO/MgO Hybrid Nanocomposites with High Specific Capacitance

Pradip Sekhar Das¹, Suvajit Bakuli¹¹, Indranil Biswas², Awadesh Kumar Mallik³, Arjun Dey⁴,
Smita Mukherjee¹, Jiten Ghosh¹ and Anoop Kumar Mukhopadhyay^{1*}

¹Advanced Mechanical and Materials Characterization Division,

²Material Characterization and Instrumentation Division,

³Bioceramics and Coating Division, CSIR-Central Glass and Ceramic Research Institute (CGCRI), Kolkata 700032, India,

⁴Thermal Systems Group, ISRO Satellite Centre, Vimanapura Post, Bangalore-560017, India

anoopmukherjee@cgcricri.res.in

mukhopadhyay.anoop@gmail.com

*Corresponding author. Present address: CSIR-Central Glass and Ceramic Research Institute, 196, Raja S.C. Mullick Road, Kolkata-700032, India. Tel.: +91 33 2473 3469/76/77/96; Fax: +91 33 2473 0957

ABSTRACT

A scalable, cost effective synthesis of reduced graphene oxide (RGO)-magnesium oxide (MgO) hybrid nanocomposite (RGOMOHNC) is reported in the present work. The process involves an in-situ sonication method in aqueous medium at room temperature e.g., 30°C. The as synthesized graphene oxide (GO) and RGOMOHNC powders are characterized by the XRD, FESEM, TEM, FTIR, RS and XPS techniques. The results indicate that in-situ growth of 20-30 nm MgO nanoparticles effectively increases the graphitic nature of the layered RGO microstructure. The experimentally measured cyclic voltammetry (CV) plots show that the specific capacitance of the RGOMOHNC powders is three orders of magnitude higher than that of the GO powders. A mechanism of RGOMOHNC formation has been proposed.

Key words: Nanocomposites; RGO/MgO; Spectroscopy; Electrodes.

¹ Present Address: Metallurgical Engineering and Materials Science, Indian Institute of Technology, Mumbai- 400076, India

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