

## Chromia-Carbon Nanocomposite Materials for Energy Storage Devices

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**Abstract :** The article reports the synthesis of Cr<sub>2</sub>O<sub>3</sub>/C nanocomposites obtained by the direct carbonization of PFA/MIL-101(Cr) bulk composite. The nanocomposites were characterized by various instrumental techniques like powder X-ray diffraction (PXRD), X-ray photoelectron spectroscopy (XPS), scanning electron microscopy (SEM), transmission electron microscopy (TEM), selected area electron diffraction (SAED) and the surface characterized were investigated via N<sub>2</sub> adsorption/desorption analysis. TEM and SAED analysis shows that turbostratic graphitic carbon was obtained with high crystallinity. The nanocomposites were tested for electrochemical supercapacitor and the faradic and non-Faradic processes were checked through cyclic voltammetry (CV). The maximum specific capacitance calculated for Cr<sub>2</sub>O<sub>3</sub>/C 900 sample from CV measurement is 301 F g<sup>-1</sup> at 2 mV s<sup>-1</sup> due to its maximum charge storing capacity as confirm by frequency response analysis.

**Keywords :** nanocomposites, transmission electron microscopy, non-faradic process

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