

## Enhanced Capacitance of A Nitrogen-Containing Carbon-Based Nanocomposite Via Noncovalent Functionalization Method

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### ABSTRACT

Ordered carbon (OC) with large surface area was prepared via replication by using Santa Barbara Amorphous-15 as a template and sucrose as a carbon precursor. The prepared OC was then noncovalently functionalized with Basic Red 2 dye precursor (BR2) to obtain OC-BR2, a nitrogen-containing carbon-based nanocomposite with enhanced electrical properties. The functionalization was explained through adsorption isotherm, kinetic, and thermodynamic studies performed under variable conditions. The electrochemical performance test results demonstrated that the nanocomposite presents enhanced capacitance (48.4%) compared with the original OC, with maximum specific capacitance of 227 F g<sup>-1</sup> at 0.5 A g<sup>-1</sup> in 1 M KOH electrolyte.

**KEYWORDS:** Basic dye; Capacitance; Functionalization; Ordered carbon; SBA-15

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