

SUPERCAPACITORS MADE FROM CU DOPED ACTIVATED CHARCOAL

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ABSTRACT

Supercapacitors are emerging as promising alternative to batteries in storing electrical energy. They are environmentally friendlier and far more recyclable than batteries. However, supercapacitors are not capable of storing comparatively larger amounts of energy and self-discharge loss is greater. Several types of supercapacitors have been invented using activated charcoal, graphite blended with other ingredients to facilitate fabrication of electrodes. This work reports effect of Cu doping of activated charcoal on capacity and stability of supercapacitors. Copper was doped by incorporation precursors and heating samples in a nitrogen atmosphere at 7000C. Number of electrolytes including aqueous H₂SO₄, NaOH and KSCN were examined and enhancements in efficiency and stability were noticed, depending on the level of doping. At ~ 5 % wt. doping capacity increased from ~ 10 F/g to 20 F/g using aqueous KSCN as electrolyte. Stability enhancement was also noticed with KSCN electrolyte, probably of adsorption of this ion on copper. The details of measurements and possible mechanisms involved in Cu doping of activated charcoal will be discussed.

Keywords: Supercapacitors, Activated Charcoal, Cu doping

Keywords: Nitrate, Polypyrrole, Nano zero valent iron, reduced graphene