Abstract

The potential of MOFs to be used in an energy storage devices has been explored. The MOFs have been synthesized and their charcteristics have been tuned to get the desirable features. This present work describes the synthesis of Copper MOFs derived from 5-sulfonatobenzene dicarboxylate sodium . 4-amino-pyridine has been used as a bridging ligand in this synthesis. Two types of Copper MOFs have been synthesized from these reactants. The effect of solvent has been observed by keeping all the reactants same in the experiments and changing the solvents. One of the Copper MOF has been synthesized by hydrothermal and the other one by sonochemical technique. Hydrothermal synthesis has been carried out at $200C^0$ for 3 days and sonochemical synthesis has been done at 15 amplitude for 30 minutes. The results of FTIR of ligand and the MOFs have been compared and the synthesis of MOFs has been confirmed. The electrochemical applications of MOFs have been determined. The oxidation and reduction reactions have been determined by cyclic voltammetry. The specific capacity, energy denisty and power density of Copper MOF have been calculated which are happened to be 4.5C/g ,0.3437Whg^{-1} and 137.5Wg^{-1} respectively. The value of R^2 and b have been found to be 0.93 and 0.49 which confirmed the battery type nature of MOFs. The discharging and charging time has been determined by Galvanometric charge/discharge analysis. The resistance offered by the electrolyte, electronic resistance and interface resistance have been determined by electro impedance spectroscopy.