ABSTRACT

Capacitive Deionization (CDI) is one of desalination method by flowing seawater through the gap between two electrodes based on the capacitor mechanism. Nanoporous carbon is one of electrodes used in CDI system due to its high surface area and porosity. In this present study, nanoporous carbon are synthesized from coconut shell with ratio of nanoporous carbon/activator varied by C:KOH:NaOH = 1:3:0, 1:3:1, 1:1:3, 1:0:3. Nanoporous carbon were then characterized using nitrogen isoterm physisorption with a highest surface area about 1657.1 m^2/g, micropore volume of 0.86 cc/g, mesopore volume of 0.06 cc/g, and total volume of 0.92 cc/g. CDI electrodes produced using a mixture of nanoporous carbon, graphite, PVA with mass ratio of 8:1:1. Desalination of those CDI cells were measured by NaCl solvents with concentration of 0.9%; 2%; 3% at flow rate of 10 ml/min. At NaCl concentration of 3%, the percentage reduction of salt level was 22.6% which is appropriate to the nanoporous carbon with surface area of 1657.1 m^2/g and capacitance of 5.428 F/g.

Keywords: Desalination, Capacitive Deionization, NaCl, Nanoporous carbon, Capacitance.