ABSTRACT

Supercapacitors are charge-storing devices that have high capacitance that come from a large specific surface area of activated carbon. Previous studies have found a linear relationship between specific surface area and capacitance, but several other studies have found contradictory results. Therefore, in this study characterization of pore structures using nitrogen isotherm physisorption on five types of activated carbon samples with various activation treatments. Activated carbon electrodes for supercapacitors are made by mixing activated carbon, carbon black and carboxymethyl cellulose (CMC) at a ratio of 8: 1: 1. The mixture is then coated on the surface of the copper plate manually. Capacitance measurements were carried out using cyclic voltammetry on 1M NaHSO4 electrolytes. Based on the characterization of cyclic voltammetry, the highest specific capacitance of 300 F / g is owned by samples with a specific surface area of 1,750 m2 / g, and mesoporous volume of 61% of the total pore volume. For other samples which have pores only on the mesoporous scale it is applicable that the specific surface area is not linear in capacitance. The greater the average pore size the greater the specific capacitance produced.

Keywords: *supercapacitor, average pore size, activated carbon, micropore, mesoporous, capacitance.*