

## ABSTRACT

Supercapacitor is an energy storage device that has a high specific capacitance compared to ordinary capacitors. Supercapacitors are made of 2 important components, namely electrodes and electrolytes. The electrodes used in the fabrication consist of a mixture of activated carbon, carbon black, and a binder. In this study, the fabrication of activated carbon electrodes based on CMC binder was carried out by adding a curing agent to strengthen the mechanical properties (adhesiveness) of the electrode. The curing agents used were epoxy, SBR and acrylic resins with a constant mass ratio of activated carbon: carbon black: adhesive 8:1:1. The electrodes that have been fabricated are then characterized for their bonding strength (adhesiveness) to determine the mechanical properties of the electrodes. Wettability test (contact angle) was conducted to see the effect of the curing agent on the penetration ability of the electrolyte and to characterize its electrical properties using the Four Point Probe (FPP). To obtain the electrochemical properties, characterization was carried out using the Cyclic Voltammetry method. In this study, from the wettability characterization, the best contact angle was found in the variation of the CMC binder ( $10.2 \pm 0.33^\circ$ ), then for the characterization of the adhesion, the best mechanical strength was found in the variation of the CMC-epoxy resin binder (99, 19 %), then the characterization of electrical properties was carried out using a four point probe (FPP), the smallest resistivity was found in the CMC binder variation ( $2.44 \Omega$ ), and for the Cyclic Voltammetry characterization, the best specific capacitance was found in the binder variation. CMC (54.69 F/g). From the research conducted, it can be concluded that the highest specific capacitance results are found in the CMC binder variation. The addition of a curing agent in this study was able to reduce wettability, resistance, and capacitance, but the mechanical strength increased for CMC-epoxy resin and SBR-2 binders. Thus, epoxy resin and SBR-2 are classified as good for long life time electrode applications.

**Keywords:** Curing agent, wettability, adhesiveness, Four Point Probe, Cyclic Voltammetry, specific capacitance.