ABSTRACT

Supercapacitors are device used to store energy. Basically, supercapacitors have many advantages including, fast access to store energy, faster charge and discharge cycles, and storage capacity up to more than 200 F/g [2]. In the making of supercapacitor electrode thin film using the method of natural ingredients used as a reducing and chelating for manganese material obtained from extracts of hibiscus leaves, ginger, and pineapple leaves with the process of mixing directly on the plate which is then measured using the cyclic voltammetry method. The process of this research is divided into several stages those are variation materials reducing and chelating agent which consist of hibiscus leaf extract, ginger, and pineapple leaves, mass variations are divided into three those are 1 mg, 10 mg, and 30 mg, the variations ratio of $MnSO_4$ to natural ingredients consist of 1 : 0.1, 1: 1, 1: 2, 1: 4, 1: 5, and 1: 6, and the last to do is a variation of the scan rate of 1 mV / s, 10 mV / s, 50 mV / s, and 100 mV / s. From several stages of variation that have been done, the results with maximum specific capacitance values are based on ginger extract with a mass of 1 mg, ratio 1: 2, and scan rate of 10 mV / s with an average specific capacitance value of 37,842 F / g. After obtaining the maximum specific capacitance value, characterization was done using SEM and XRD. From the SEM results of ginger extract with a magnification of 50000 times and hibiscus leaf extract with magnification of 10000 times and 50000 times showed that there are pores on the surface, whereas in ginger extract with magnification of 10000 times showed large lumps. Then the XRD characteristic test results of ginger extract and hibiscus leaf showed that there was a peak which meant the presence of manganese compounds on the graph.

Keywords: Supercapacitors, *mangan oxide*, specific capacitance, electrode, thin film.