ABSTRACT

THE CONVERSION OF α-CELLULOSE TO CARBOXIMETHYL CELLULOSE FROM PALM OIL EMPTY FRUIT BUNCH

By

Ridho Nahrowi

The conversion of the α-cellulose to carboxymethyl cellulose (CMC) was performed by alkalization and etherification methods. The variation of sodium hydroxide concentrations were used 15, 20, 25 and 30%. The analysis of CMC was conducted using DTG/DTA/TGA, FTIR, SEM, XRD as well as the degree of subtitution. The values of substitution degree for each sodium hydroxide concentrations were 0.17 0.12 0.25 and 0.12 respectively. The optimum degree of substitution value was 0,25 which obtained at sodium hydroxide concentration. Base on the thermogram data showed that the decomposition at 245-320^{o}C was 25.80% which indicated the presence of CMC. The thermogram of differential thermal analysis exhibited endotherm property at 83.1^{o}C and exotherm property at 496.1^{o}C. The thermogram of differential thermogravimetric at 285.62^{o}C showed that the degradation of CMC was 626.78 ug/min. The fourier transform infrared spectrum at 1604 cm^{-1} indicated that the carbonyl group attached at α-cellulose. Based on the scanning electron microscopy, the CMC had tenuous morfology surface. In addition, the X-ray difractogram showed that the CMC has crystal size of 2.8 nm and crystalinity of 35.5%.

Key Words: Palm oil Empty Fruit Bunch, α-Cellulose, Carboxymethyl Cellulose.