

## **ABSTRACT**

### **EFFECT OF NaOH CONCENTRATION ON CHARACTERIZATION OF $\alpha$ -CELLULOSE FROM OIL EMPTY FRUITS BUNCHES (EFB)**

**Oleh**

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The cellulose separation of oil palm empty fruit bunches has been done by delignification and bleaching using  $\text{HNO}_3/\text{NaOH}$  at  $50^\circ\text{C}$  and  $\text{NaOCl}/\text{H}_2\text{O}_2$ . The variation of NaOH concentrations are 2%, 4%, 6% and 8%, respectively  $\alpha$ -cellulose obtained were: 94,26%, 88,90%, 91,07% and 88,52%. The lignin residue of cellulosa were: 0.5%, 6%, 1.75% and 1.5%. The characterization of  $\alpha$ -cellulose were conducted by FTIR Spectrometry, SEM analyzed, TGA / DTA / TGA, and XRD Analyzed. The spectrum IR of  $\alpha$ -cellulose displayed the -OH stretching at  $3300\text{-}3440\text{ cm}^{-1}$ , C-H stretching at  $2900\text{ cm}^{-1}$ , C-O bend at  $1635\text{ cm}^{-1}$ , C-H bend at  $1373.32\text{ cm}^{-1}$  and C-O stretching at  $1060\text{ cm}^{-1}$  were indicated of cellulose. SEM exhibited sized of  $\alpha$ -cellulose yield was  $20\text{-}50\text{ }\mu\text{m}$ . The thermogram of DTA/DTG/TGA seen material solidity of cellulose NaOH 2 %. The diffraktogram of XRD showed high cristallinity was cellulose NaOH 2 %.

**Keyword :** Oil empty fruits bunches (EFB), Cellulose, Lignin, FTIR, DTG/DTA/TGA, SEM, XRD.

## **ABSTRAK**

### **PENGARUH KONSENTRASI NaOH PADA KARAKTERISASI $\alpha$ - SELULOSA DARI TANDAN KOSONG SAWIT (TKS)**

**Oleh**

**Tazkiya Nurul**

Pada penelitian ini telah dilakukan pemisahan selulosa dari tandan kosong sawit menggunakan metode delignifikasi dengan  $\text{HNO}_3$  dan NaOH pada  $50^\circ \text{C}$  serta pemutihan menggunakan NaOCl dan  $\text{H}_2\text{O}_2$ . Variasi konsentrasi NaOH adalah 2%, 4%, 6% dan 8% dengan kadar  $\alpha$ -selulosa yaitu: 94,26%, 88,90%, 91,07% dan 88,52%. Lignin yang tersisa dalam  $\alpha$ -selulosa yaitu: 0,5 %, 6 %, 1,75%, dan 1,5 %. Karakterisasi menggunakan FTIR Spektrometri, Analisis SEM, TGA/DTA/TGA, dan Analisis XRD. Spektrum IR masing-masing  $\alpha$ -selulosa menunjukkan adanya gugus  $-\text{OH}$  ulur pada  $3300\text{-}3440 \text{ cm}^{-1}$ , ikatan C-H ulur pada  $2900 \text{ cm}^{-1}$ , C-O tekuk pada  $1635 \text{ cm}^{-1}$ , C-H tekuk pada  $1373,32 \text{ cm}^{-1}$  dan ikatan C-O ulur pada  $1060 \text{ cm}^{-1}$  yang menginterpretasikan  $\alpha$ -selulosa. Analisis SEM menunjukkan ukuran  $\alpha$ -selulosa 20-50  $\mu\text{m}$ . Termogram DTA/DTG/TGA menunjukkan  $\alpha$ -selulosa NaOH 2 % memiliki kesolidan tinggi. Berdasarkan difraktogram XRD kristalinitas tertinggi didapat pada  $\alpha$ -selulosa NaOH 2 %.

Kata kunci : Tandan Kosong Sawit, Selulosa, Lignin, FTIR, DTG/DTA/TGA, SEM, XRD.