

**EFFECT OF ALKALINE TREATMENT ON PROPERTIES
OF CELLULOSE NANOFIBRIL ISOLATED FROM OIL
PALM MESOCARP (OPM) BIOMASS**

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ABSTRACT

EFFECT OF ALKALINE TREATMENT ON PROPERTIES OF CELLULOSE NANOFIBRIL ISOLATED FROM OIL PALM MESOCARP (OPM) BIOMASS

Oil palm mesocarp (*Elaeis guineensis*) was explored as a source of raw material for production of cellulose nanofibers (CNFs). CNFs was isolated using two types of alkaline treatment which are sodium hydroxide (NaOH) and potassium hydroxide (KOH) followed by 1.5 and 3 hours sonication respectively. Pretreatment was conducted to remove unwanted components such as hemicellulose and lignin. The CNFs obtained were characterized using FTIR, UV-Vis, SEM and chroma meter. The percentage yield of the CNF treated with sodium hydroxide (NaOH) with 3 hours sonicated is 56.62% while with 1.5 hours is 55.88%. Besides, the percentage yield of the CNF treated with potassium hydroxide (KOH) with 1.5 hours sonicated is 50.37% while with 3 hours is 51.62%. According to infrared spectra obtained, the absence of hemicellulose (C=O) di 1740 cm^{-1} and lignin (C-O-C) di 1248 cm^{-1} was observed after pretreatment was conducted. Moreover, the existence of glycosidic linkage (CH) di 830 cm^{-1} proved the alkaline treatment those not degrade the cellulose structure. Predetermination of CNFs size was carried out using UV-Vis showing all CNFs obtained 90% of transmittance indicating major sizes is less than 500 nm. The value obtained from chroma meter showing CNFs demonstrated the value of L (lightness) s above 50 showing all CNFs are transparent. Morphological determination with SEM showing rod like shape with low porosity due to hydrogen bond interaction occur during air dried process.