EVALUATION OF PHYSICOCHEMICAL PROPERTIES OF OIL PALM EMPTY FRUIT BUNCH AND MESOCARP FIBRES ASPAPER MAKING RAW MATERIALS

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ABSTRACT

Comparative study of physicochemical characteristics of Oil Palm Empty Fruit Bunch (OPEFB) and Oil Palm Mesocarp Fibre (OPMF) was carried out, pulping, bleaching and paper making were done according to Technical Association of Pulp and Paper Industries (TAPPI) Standards of USA. The results obtained showed that the chemical components of Oil Palm Empty Fruit Bunchand Oil Palm Mesocarp Fibre were: moisture content (21%, 18%); ash content (9.12%, 4.55%); lignin (16.15%, 18.65%); cellulose (44.56%, 42.22%); hemicelluloses (31.24%, 31.85%) respectively. The solubility in cold water (8.32%, 8.76%); hot water (15.16%, 19.12%); 1% NaOH (33.75%, 34.15%); 18% NaOH (38.65%, 40.85%); and 2:1 ethanol–benzene (20.51%, 27.38%) were obtained respectively. The fibre dimensionsdetermined by digital camera microscope, Model XSZ, 2003 were: fibre length (0.95, 0.86) mm; fibre diameter (13.66, 12.35) μm; fibre width (5.82, 5.31) μm; cell wall thickness (3.42, 3.09) μm; Runkel ratio (1.0, 1.0); and flexibility coefficient (0.50,0.50) respectively. The yields of the unbleached pulp of OPEFB and OPMF were 40.52% and 34.86% while the bleached pulps were 57.35% and 47.33% respectively, and the residual lignin expressed as Kappa number were 50% and 60% respectively. The sheets formed from the pulps had good formation but with low tensile – tear strength of (0.01N/m, 0.01N/m); thus, these pulps belong to short fibre class which implies that they should be blended with other long fibre pulpsto produce strong customized sheets for different applications.