

Thermo-physico-chemical and statistical mechanical properties of Washingtonian filifera new lignocellulosic fiber. Engineering Solid Mechanics

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Abstract: In this work, novel cellulosic fibers are extracted from Washingtonia Filifera (WF) plant using an environment-friendly technique. Morphological, Physico-chemical, thermal and mechanical properties are reported in this paper. Micro graphical SEM shows the presence of cells in the fiber. FTIR and XRD experimental analyzes show a cristinality index of 48.88%, and the WF fibers are found to be thermally stable until 201°C by using TGA and DTG thermographic analyzes with an appropriate activation energy of 72.46 kJ/mol, where Young modulus and tensile strength of strain were determined using tensile tests of single fiber at 2.17 GPa, 134 MPa and 26.55%, respectively. Mechanical properties are analyzed using a statistical method.

Keywords : WF fibers, mechanical properties, FTIR, XRD, TGA, Statistical methods