

Modification of Date Palm Leaflets Fibers Used as Thermoplastic Reinforcement

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Abstract : The fiber-matrix compatibility can be improved if suitable enforcements are chosen. Whenever the reinforcements have more thermal stability, they can resist to the main processes for wood-thermoplastic composites. This paper is an investigation of effect of different treatment process on the mechanical proprieties and on the thermal stability of date palm leaflets fibers with a view to improve the date palm fiber proprieties used as reinforcement of thermoplastic materials which main processes require extrusion, hot press. To compare the effect of alkali and acid treatment on the date palm leaflets fiber properties, different treatment were used such as Sodium hydroxide NaOH solution, aluminium chloride AlCl₃ and acid treatment with HCL solution. All treatments were performed at 70°C for 4h and 48 h. The mechanical performance (tensile strength and elongation) is affected by immersion time in alkaline and acid solutions. The reduction of the tensile strength and elongation of fibers at 48h was higher in acid treatment than in alkali treatment at high concentration. No significant differences were observed in mechanical and thermal proprieties of raw fibers and fibers submerged in AlCl₃ at low concentration 1% for 48h. Fibers treated by NaOH at 6% for 4h showed significant increase in the mechanical proprieties and thermal stability of date palm leaflets fibers. Hence, soda treatment is necessary to improve the fibers proprieties and consequently optimize the composite performance.

Keywords : date palm fibers, surface treatments, thermoplastic composites, thermal analysis

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