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Study of the properties of thermoplastic composites filled with date palm waste

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Abstract : Green polymer composites were prepared by adding 5 wt% of treated date palm tree waste as a filler to linear low-density polyethylene (LLDPE) and polystyrene (PS) matrices. A green treatment was applied using a gum Arabic solution, after which the filler was characterized, and the rheological, thermal, and mechanical properties of the resulting composites were investigated. A comparison of the composites with the original polymers showed no changes in the Vicat softening temperature (VST). The differential scanning calorimetry (DSC) results of the PS composites showed similar results, while the DSC results of the LLDPE composites were quite different, especially for the fiber/LLDPE composites.The Young's modulus, tensile strength at break, and the elongation at break were affected by the addition of the filler.

Keywords : Date palm, Gum Arabic, Green composites.

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