Mechanical and Thermal Properties of Oil Palm Empty Fruit Bunch-Filled Unplasticized Poly (Vinyl Chloride) Composites

A. Abu Bakar[1], A. Hassan[1] and A.F. Mohd Yusof[2]

[1]Department of Polymer Engineering, Universiti Teknologi Malaysia, 81210, Skudai, Johor, Malaysia
[2]Plastics Technology Centre, SIRIM Bhd. Shah Alam, P.O.Box 7035, 40911, Selangor, Malaysia

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SUMMARY

Awareness of the advantages of natural fibres has stimulated interest in their use to reinforce polymers. One type of natural fibre that is of great relevance to Malaysia is oil palm empty fruit bunches (EFB). To produce EFB-filled unplasticized poly(vinyl chloride) (PVC) composites, PVC resin and the various additives were first dry-blended using a laboratory blender before being milled into sheets on a two-roll mill. Test specimens were then hot pressed, after which the mechanical and thermal properties were determined. Four untreated EFB fibre contents were employed, 10, 20, 30 and 40 phr. The increase in EFB fibre content resulted in an improvement in flexural modulus at the expense of impact strength and flexural strength. The incorporation of EFB slightly enhanced the glass transition temperature but it decreased the thermal stability of the composites, evidenced by a decrease in decomposition temperature and a change in the degradation process from two to three stages.