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Fracture Toughness Properties and FTIR Analysis of Corn Fiber Green Composites

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Abstract : In this work, the fracture toughness of new green composite based on bio-PMMA resin reinforced with randomly short corn natural fiber of constant weight fraction by 10% wt was investigated. The corn fiber surface was modified by mercerization treatment with two different concentrations of sodium hydroxide (3, and 5% NaOH) for 1.5 and 3 hours respectively. The effect of mercerization treatment on the fracture behavior of the green composites was analyzed by FTIR spectra. NaOH concentration of 3% for 1.5 hrs. That was used for corn fiber green composite should the highest improvement in terms of plane strain fracture toughness KIC which increased by 62 % compared to untreated fiber composite material. On the other hand, increased both concentrations of alkali solution to 5% NaOH and time of soaking to 3 hrs. reduced the values of KIC lower than the value of the unfilled material.

Keywords : green composites, fracture toughness, corn natural fiber, bio-PMMA
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