

Characterization of raw and alkali treated new natural cellulosic fibers from Tridax procumbens

ABSTRACT

The aim of this study is to investigate natural cellulosic fibers extracted from Tridax procumbens plants. The obtained fibers were alkali treated for their effective usage as reinforcement in composites. The physical, chemical, crystallinity, thermal, wettability and surface characteristics were analyzed for raw, and alkali treated Tridax procumbens fibers (TPFs). The test results conclude that there was an increase in cellulose content with a reduction in hemicellulose, lignin, and wax upon alkali treatment. This enhanced the thermal stability, tensile strength, crystallinity, and surface roughness characteristics. The contact angle was also lesser for treated TPFs which prove its better wettability with the liquid phase. The Weibull distribution analysis was adopted for the analysis of the fiber diameter and tensile properties. Thus the considerable improvement in the properties of alkali treated TPFs would be worth for developing high-performance polymer composites.

Keyword: Tridax procumbens fibers; Weibull distribution; Tensile strength; Crystallinity index; Contact angle