

Description of a new cellulosic natural fiber extracted from *Helianthus tuberosus* L. as a composite reinforcement material

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Abstract

Natural fiber-reinforced composites are generally known as eco-friendly, long-lasting, and recyclable materials. Considering, this study characterizes cellulosic *Helianthus tuberosus* L. fiber for polymer-based green composites for the first time. It has been found that *Helianthus tuberosus* L. fiber has many advantages as a reinforcement material in polymer-based composites. For example, the high roughness provided by the fiber surface in cellular morphology increases the locking into the composite body. One of the most critical advantages is its high thermal stability temperature of 247.3 °C. Also, other advantages of the *Helianthus tuberosus* L. fiber can be listed as high cellulose content, high crystallinity, and high tensile strength. The hollow fiber structure can allow it to be used in materials used for insulation. Eventually, the high cellulose content of 62.65% supports its usage in various industries, including paper and paperboard manufacturing.

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