



Article

# Improved thermal properties of jute fiber-reinforced polyethylene nanocomposites

[Md. Faruk Hossen](#)

[Sinin Hamdan](#)

[Md. Rezaur Rahman](#)

[Md. Saiful Islam](#)

[Fui Kiew Liew](#)

[Josephine Chang Hui Lai](#)

[Md. Mizanur Rahman](#)

First published: 14 July 2015

<https://doi.org/10.1002/pc.23691>

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Abstract

The thermal behavior of chemically modified jute fiber-reinforced polyethylene (PE) nanocomposites was investigated. Nanocomposites were prepared by hot press molding technique using different fiber loadings (5, 10, 15, and 20 wt%) for both treated and untreated fibers. Jute fibers were chemically modified with benzene diazonium salt to increase their compatibility with the PE matrix. Surface and thermal properties were subsequently characterized. Fourier transform infrared spectroscopy and scanning electron microscopy analysis were used to study the surface morphology. Thermogravimetric analysis (TGA) and differential scanning calorimetry were carried out for thermal characterization. Fourier transform infrared spectroscopy and scanning electron microscopy study showed interfacial interaction among jute fiber, PE, and nanoclay. It was observed that, at optimum fiber content (15 wt%), treated jute fiber-reinforced composites showed better thermal properties compared with that of untreated ones and also that nanoclay-incorporated composites showed enhanced higher thermal properties compared with those without nanoclay. POLYM. COMPOS., 38:1266–1272, 2017. © 2015 Society of Plastics Engineers.