

Accepted Manuscript

Full Length Article

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PII: S0169-4332(18)30471-9
DOI: <https://doi.org/10.1016/j.apsusc.2018.02.128>
Reference: APSUSC 38586

To appear in: *Applied Surface Science*

Received Date: 30 November 2017
Revised Date: 11 February 2018
Accepted Date: 12 February 2018

Please cite this article as: A. Reghunadhan, J. Datta, N. Kalarikkal, J.T. Haponiuk, S. Thomas, Toughness augmentation by fibrillation and yielding in nanostructured blends with recycled polyurethane as a modifier, *Applied Surface Science* (2018), doi: <https://doi.org/10.1016/j.apsusc.2018.02.128>

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Toughness augmentation by fibrillation and yielding in nanostructured blends with recycled polyurethane as a modifier

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Abstract

In the present paper, we have carefully investigated the morphology and fracture mechanism of the recycled polyurethane (RPU) /epoxy blend system. The second phase (RPU) added to the epoxy resin has a positive effect on the overall mechanical properties. Interestingly, the recycled polymer has a remarkable effect on the fracture toughness of epoxy resin. The mechanism behind the fracture toughness improvement up on the addition of RPU was found to be very similar to that of the incorporation of hyperbranched polymers in epoxy resin. Brittle to ductile fracture was clear in the case of higher loadings such as 20 and 40 phr of RPU in the epoxy resin. The mechanism behind improvement of fracture toughness was found to fibrillation

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