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PII: S1005-0302(17)30108-1
DOI: http://dx.doi.org/doi:10.1016/j.jmst.2017.04.001
Reference: JMST 960

To appear in:

Received date: 23-3-2016
Revised date: 7-6-2016
Accepted date: 20-6-2016

Please cite this article as: {http://dx.doi.org/

Mechanical, tribological and heat resistant properties of fluorinated multi-walled carbon nanotube/bismaleimide/cyanate resin nanocomposites

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[Received 23 March 2016; received in revised form 7 June 2016; accepted 20 June 2016]

Bismaleimide containing cyanate resin (BMI/CE) pre-ploymer was used as resin matrix. Fluorinated multi-walled carbon nanotubes (F-MWCNTs) were used as fillers to prepare F-MWCNT/BMI/CE nanocomposites via a solution intercalation method. The influence of F-MWCNT content on the mechanical, tribological and heat resistant properties of the nanocomposites was investigated. The morphology of the fracture surface and the wear surface of nanocomposites were characterized by scanning electron microscopy. Results show that the addition of F-MWCNTs is beneficial to improving the mechanical and tribological properties of the nanocomposites. It's worth noting that when the content of F-MWNTs was 0.6 wt%, the performances of nanocomposite are optimized (i.e., highest impact strength, lowest frictional coefficient and wear rate). In addition, the nanocomposites exhibit good thermal stability in comparison with BMI/CE.

Keywords: Carbon nanotubes, Nanocomposites, Mechanical property, Tribological properties, Thermal stability