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Symposia/Special Sessions/Technical Tracks/Student Competition:

C1 Advanced Functional Materials

Oral or Poster presentation:

Oral

If an oral presentation is not available would a poster be acceptable?:

No

Presenting or Corresponding Author:

Presenter

Abstract Title:

Effect of Physical Structure of Nitrogen-doped Carbon Nanotube on the Nonlinear Viscoelastic Response of Polymer Nanocomposites

Abstract:

In this work, we investigate the effect of nitrogen-doped carbon nanotube (N-CNT) physical structure, i.e., length, diameter, carbon purity, nitrogen content, and nitrogen bonding type, on the nonlinear viscoelastic behavior of polymer nanocomposites thereof. To achieve this, a series of N-CNTs were synthesized via chemical vapor decomposition (CVD) method. To manipulate N-CNT's structure, N-CNTs were synthesized over the different types of catalyst (Fe, Ni, and Co) at 750 °C or at different synthesis temperatures (550°C, 650°C, 750°C, 850°C and 950°C) over Fe catalyst. N-CNTs were melt-mixed into a poly(vinylidene fluoride) (PVDF) matrix at various loadings. Nanofillers characterizations, viz., TGA, XPS and microscopy imaging, revealed that the synthesis parameters had a considerable impact on N-CNT physical structure, which, in turn, influenced the resulting network structure of the nanofillers throughout the PVDF matrix. The network structure of synthesized N-CNTs was evaluated using nonlinear viscoelastic rheology (large amplitude oscillatory shear (LAOS)), and verified with image analysis and broadband electrical conductivity.

Invited Speaker:

No

Presentation Recording:

No

Would you like to be entered into the Graduate Student Poster Competition?:

N/A

I would like my presentation to be considered for publication in the special issue of the Canadian Journal of Chemical Engineering. :

No

Yes, I acknowledge that the co-authors that will be listed on this submission are aware and have agreed to be listed.:

Yes, co-authors are aware and have agreed