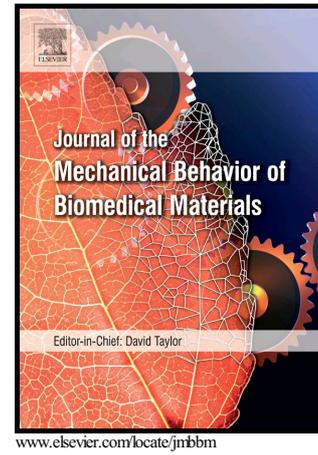


Author's Accepted Manuscript

Assessment of nanoscopic dynamic mechanical properties and B-C-N triad effect on 1D/2D nanofillers reinforced HDPE hybrid composite using oscillatory nanoindentation: An insight into medical applications

Nitesh Dhar Badgayan, Santosh Kumar Sahu, Sutanu Samanta, P.S. Rama Sreekanth



PII: S1751-6161(18)30040-7
DOI: <https://doi.org/10.1016/j.jmbbm.2018.01.027>
Reference: JMBBM2666

To appear in: *Journal of the Mechanical Behavior of Biomedical Materials*

Received date: 22 November 2017
Revised date: 23 January 2018
Accepted date: 26 January 2018

Cite this article as: Nitesh Dhar Badgayan, Santosh Kumar Sahu, Sutanu Samanta and P.S. Rama Sreekanth, Assessment of nanoscopic dynamic mechanical properties and B-C-N triad effect on 1D/2D nanofillers reinforced HDPE hybrid composite using oscillatory nanoindentation: An insight into medical applications, *Journal of the Mechanical Behavior of Biomedical Materials*, <https://doi.org/10.1016/j.jmbbm.2018.01.027>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Assessment of nanoscopic dynamic mechanical properties and B-C-N triad effect on 1D/2D nanofillers reinforced HDPE hybrid composite using oscillatory nanoindentation: An insight into medical applications

Nitesh Dhar Badgayan¹, Santosh Kumar Sahu^{1,2}, Sutanu Samanta¹, Rama Sreekanth P S^{*3}

¹Department of Mechanical Engineering, North Eastern Regional Institute of Science and Technology, Nirjuli, Arunachal Pradesh, India-791109

²Department of Mechanical Engineering, National Institute of Science and Technology, Berhampur, Odisha, India-761008

³Department of Mechanical Engineering, Vellore Institute of Technology- AP University, Inavolu, Amaravati, Andhra Pradesh, India, 522237

*Corresponding author, email: happyshrikanth@gmail.com

Abstract

A thrust on improvement of different properties of polymer has taken a contemporary route with advent of nanofillers. Although several nanofillers are existent; Multi Walled Carbon Nanotubes- (MWCNTs) and h-Boron Nitride nanoplatelets-(h-BNNPs) unique combination of 1D and 2D dimensional geometry aids an advantage of B-C-N triad elemental effects on properties of tested samples. The current study aims to investigate the effects of MWCNT and h-BNNP reinforcement in High Density Polyethylene (HDPE) for high load bearing areas of medical applications requiring both elastic and viscous behavior. The results were analyzed keeping a view of its application in areas like HDPE based fracture fixation plates, acetabular cups and others. The composite and hybrid samples with different loadings were prepared after surface modification of nanofillers by mechanical mixing and molding technique. The dynamic nano-mechanical properties like storage modulus, loss

Download English Version:

<https://daneshyari.com/en/article/7207163>

Download Persian Version:

<https://daneshyari.com/article/7207163>

[Daneshyari.com](https://daneshyari.com)