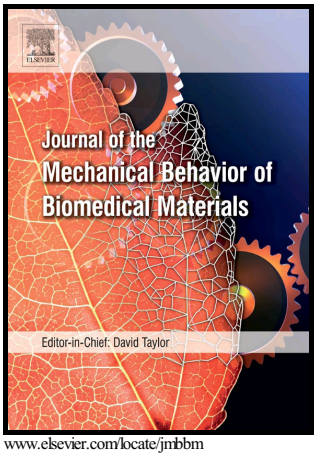


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# Assessment of nanoscopic dynamic mechanical properties and B-C-N triad effect on 1D/2D nanofillers reinforced HDPE hybrid composite using oscillatory nanoindentation: An insight into medical applications

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## 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