

## Understanding the effect of filler size in ultra-high molecular weight polyethylene composites with nano- and micron-size boron nitride

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Ultra-high molecular weight polyethylene (UHMWPE) fibers incorporating either nano boron nitride (nBN) or micron boron nitride (mBN) platelets were fabricated under shear crystallization with overall filler concentration of 11wt%. This process yields fibers consisting of hybrid UHMWPE/boron nitride fibrillar crystal bundles. X-ray diffraction (XRD) and differential scanning calorimetry (DSC) experiments show that the crystallization of the UHMWPE changes whether in the presence of nano or micron BN. Orientation of the polymer is also more pronounced in samples with nBN as compared to mBN. In addition, mechanical characterization of both UHMWPE/nBN and UHMWPE/mBN fibers as compared to the control fibers show improvement in modulus and tensile strength. These results as well as further thermo-mechanical and microscopy characterization studies will be discussed in this poster.

### Biography

Navid Tajaddod is a Ph.D. candidate at Northeastern University, College of Engineering. He is currently a graduate research assistant in Macromolecular Innovations in Nanomaterial Utilizing Systems (MINUS) Lab. To date, he has published one peer reviewed journal articles and presented three conference papers and posters.

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