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Dielectric properties of cluster-deposited TiO_2 nanocomposites B. BALAMURUGAN, University of Nebraska, KRISTIN KRAEMER, Unviversity of Nebraska, X. WEI, Unviersity of Nebraska, STEPHEN DUCHARME, Unversity of Nebraska, D.J. SELLMYER, University of Nebraska — TiO_2-polymer nanocomposites are expected to have a high dielectric permittivity of TiO_2 and large breakdown strength of the polymer, resulting in high energy density suitable for energy storage devices. Since chemically prepared nanocomposites tend to have poor film quality and inhomogeneities due to agglomeration, cluster deposition technique was used to prepare monodispersed TiO_2–paraffin nanocomposite films. TiO_2 clusters were coated in-flight with paraffin wax having comparatively better dielectric strength (7.9 – 11.8 MV/m) using a thermal evaporation source in prior to deposition. Bare TiO_2 clusters with average particle size ranging from 8 to 12 nm having a maximum dielectric permittivity of 54 were obtained. The structural and dielectric properties of these nanocomposites with varying volume fractions will be discussed. This research is supported by ONR and NCMN.

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