

## The Role of Nano Glass Flakes on Morphology, Dynamic-Mechanical Properties and Crystallization Behavior of Poly (Ethylene Terephthalate)

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**Abstract :** This paper studies the effect of nano glass flakes on morphology, dynamic-mechanical properties, and crystallization behavior of poly (ethylene terephthalate) (PET). The concentration of nano glass flakes was varied from 0.5, 1, 2, and 3% wt of the total formulation. Scanning electron microscopy (SEM) micrographs showed the poor distribution of nano-glass flake particles in PET, as well as low adhesion of particles to the polymer matrix. According to differential scanning calorimetry (DSC), the crystallization rate and crystallization temperature of PET were increased by the addition of nano glass flakes. The crystallization rate of PET was increased from 31.41% to 34.25% by the incorporation of 1%wt of nano glass flakes. Based on the results of the dynamic-mechanical analysis, the storage modulus of PET gets increased by adding nano glass flakes, especially below glass transition temperature (T<sub>g</sub>). The glass transition of PET did not change remarkably with the addition of nano glass flakes. Moreover, the use of nano glass flakes reduced the impact strength of PET.

**Keywords :** PET, nano glass flakes, morphology, crystallization

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