

## Preparation and Properties of PP/EPDM Reinforced with Graphene

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**Abstract :** Polypropylene(PP)/Ethylene Propylene Diene Monomer (EPDM) samples (80/20) containing 0, 0.5, 1, 1.5, 2, 2.5, and 3 (expressed in mass fraction) graphene were prepared using melt compounding method to investigate microstructure, mechanical properties, and thermal stability as well as electrical resistance of samples. X-Ray diffraction data confirmed that graphene platelets are well dispersed in PP/EPDM. Mechanical properties such as tensile strength, impact strength and hardness demonstrated increasing trend by graphene loading which exemplifies substantial reinforcing nature of this kind of nano filler and it's good interaction with polymer chains. At the same time it is found that thermo-oxidative degradation of PP/EPDM nanocomposites is noticeably retarded with the increasing of graphene content. Electrical surface resistivity of the nanocomposite was dramatically changed by forming electrical percolation threshold and leads to change electrical behavior from insulator to semiconductor. Furthermore, these results were confirmed by scanning electron microscopy(SEM), dynamic mechanical thermal analysis (DMTA), and transmission electron microscopy (TEM).

**Keywords :** nanocomposite, graphene, microstructure, mechanical properties

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