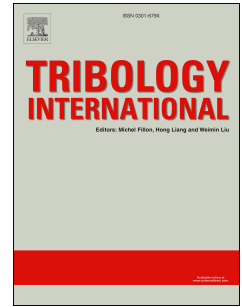


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Epoxy-Graphene-MoS₂ Composites with Improved Tribological Behavior under Dry Sliding Contact

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Abstract

In the present study, novel ternary epoxy-graphene-MoS₂ composites have been prepared. Graphene and MoS₂ filler materials in 5, 10 and 20 wt.% have been utilized to prepare the epoxy composites, and physiochemical, thermal and tribological behaviors of the composites are described. Thermal stability of the prepared epoxy composites improves with an increase in particle concentration. Compared to the binary epoxy-graphene and epoxy-MoS₂ composites, the ternary epoxy-graphene-MoS₂ composite effectively reduces the friction coefficient and the wear rate. The estimated values of the friction coefficient and the wear rate of the ternary composites were found in the range of 0.0023–0.0048 and 1.22×10^{-7} – 1.44×10^{-7} mm³/N-m, respectively. The excellent tribological and thermal-decomposition properties of the prepared ternary composites make them suitable for light-weight automotive applications.

Keywords: Thermal effects; Wear testing; Polymer-matrix composite; Graphene.

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