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CuO nanosheets produced in graphene oxide solution: an excellent anti-wear additive for self-lubricating polymer composites

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Abstract

In the present work, graphene oxide is used as template to produce CuO nanosheets, which solves aggregation and dispersion problems of CuO nanosheets resulting in improved lubricating performance. SEM and AFM studies show that CuO nanosheets are present in fusiform flake shape with a thickness, width and length of around 13, 400 and 1000 nm, respectively. CuO nanosheets were added to the carbon fibers reinforced Polytetrafluoroethylene (CF/PTFE) to study their lubricating performance. It is interesting, from fractured surfaces of composites, to find that CuO nanosheets enhance the interface properties between carbon fibers and PTFE. The wear resistance property of CF/PTFE is remarkably improved after filling CuO nanosheets. For example, the wear rate is reduced

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