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Preparation of Stable and Impurity-Free Graphene Oxide Dispersion in Various Organic Solvents

In this study, we demonstrate a simple two-step method for producing stable graphene oxide (GO) dispersions in various organic solvents without stabilizers or chemical modifications. In this method, the exfoliation and dispersion processes, which are commonly performed simultaneously, are separated. Perfectly exfoliated single-layer GO is firstly prepared in water and then water is carefully replaced with each solvent. Although this new method is simple and requires no stabilizers or chemical modifications, it achieved GO dispersions with much improved long-term stability in organic solvents compared to those prepared by the conventional method (Figure 1). Additionally, impurity contents such as S and N were minimal. A simple GO/PVC composite is also presented in this study. The GO/PVC composite prepared by the new method showed better mechanical and electrical performances compared to that prepared by the conventional method. This facile process for forming stable GO dispersions will fulfill the needs of scientists and engineers in developing applications using GO.

Reference

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Figure

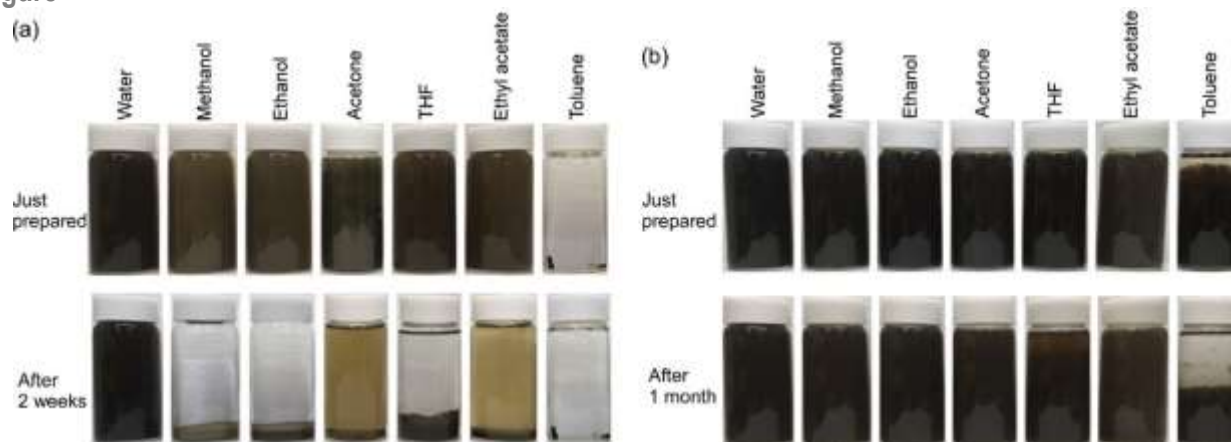


Figure 1: Photographs of (a) GO dispersions prepared by the conventional method, just prepared and after two weeks, and (b) GO dispersions prepared by the new method, just prepared and after one month.