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Investigation of extraction yields of exfoliated graphene in deionized water from organic solvents (Article) (Open Access)

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Abstract

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Organic solvent is suitable for the exfoliation of graphene . However, for the end application of exfoliated graphene it needs to extract and re-disperse to the required media. Extraction of exfoliated graphene from organic solvents to a polar solvent is a crucial challenge in graphene synthesis. The principal objective of this study is to examine the concentration yields of exfoliated graphene extraction and make a comparison of the estimated percentage concentrations of graphene in between organic solvents and deionized water (DW). Exfoliated graphene from the solvents N-Methyl-2-Pyrrolidone (NMP) and N, N-dimethylformamide (DMF) were taken. The extraction of exfoliated graphene was conducted by membrane filter using a vacuum filtration system. Concentration of exfoliated graphene solvents were estimated using Beer's law by preparing separate standard graphs. It is seen that concentrations of exfoliated graphene in DW from both NMP and DMF solvents for all the centrifugation was reduced. These reductions were found to be varied from ~ 21 to 25.5%. Morphology analysis using TEM and FESEM images reveals that the few layers of graphene staked in the sonication assisted liquid phase exfoliated (LPE) graphene in both of NMP and DMF solvents . Very minor levels of aggregation occurred and very slight sedimentation appeared after centrifugation of 30 days. © 2019 Faculty of Engineering, Universitas Indonesia.

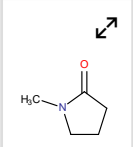
SciVal Topic Prominence

Topic: Graphene | Graphite | Liquid-phase exfoliation

Prominence percentile: 99.551

Chemistry database information

Substances



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