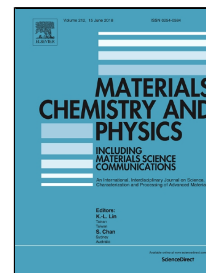


Accepted Manuscript

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PII: S0254-0584(18)30413-9
DOI: 10.1016/j.matchemphys.2018.05.017
Reference: MAC 20632
To appear in: *Materials Chemistry and Physics*
Received Date: 29 March 2018
Revised Date: 06 May 2018
Accepted Date: 11 May 2018

Please cite this article as: Alireza Mousavi, Hossein Roghani-Mamaqani, Mehdi Salami-Kalajahi, Sina Shahi, Amin Abdollahi, Grafting of silica nanoparticles at the surface of graphene for application in novolac-type phenolic resin hybrid composites, *Materials Chemistry and Physics* (2018), doi: 10.1016/j.matchemphys.2018.05.017

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Grafting of silica nanoparticles at the surface of graphene for application in novolac-type phenolic resin hybrid composites

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ABSTRACT

Hybrid composites of novolac resin were prepared by using graphene oxide (GO) which was functionalized with furfuryl alcohol and silica nanoparticles (SiO₂). For this purpose, SiO₂ was modified with silane coupling agent of (3-aminopropyl)triethoxysilane (APTES) to obtain SiO₂-NH₂ and subsequently attached at the surface of furfuryl alcohol-modified GO (GOFA) to obtain SGOFA. The SGOFA was incorporated into the novolac resin matrix in two different contents of 4 and 8 wt% of the matrix. Successful modification processes of GO with furfuryl alcohol, SiO₂ with APTES, and GOFA with SiO₂-NH₂ were confirmed by Fourier-transform infrared

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