



Graphene-based aerogels as absorbents for gas and liquid pollutants

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ABSTRACT

Graphene has been the focus of interest since its discovery in 2004 due to its outstanding electrical, thermal and mechanical behavior. In order to fully exploit the properties of graphene, certain methodologies have been developed to arrange this 2D material into 3D structures such as aerogels[1]. Graphene aerogels, due to their high surface area and high porosity are used in waste removal and gas sensing applications[2], [3]. In general, graphene oxide (GO) is an appropriate precursor to prepare 3D graphene assemblies due to its high dispersion in aqueous media and potential for functionalization. In this research work, reduced graphene aerogels (r-GAs) were prepared from an aqueous GO solution via a hydrothermal process by adding the appropriate reducing agents yielding by self-assembly a 3D structure, reduced graphene hydrogels (r-GHs). The removal of solvents from the wet gels and substitution with air was done by freeze-drying process resulting in r-GAs. Scanning Electron Microscopy, X-ray diffraction and Raman Spectroscopy were used to characterize the produced r-GAs. Finally, the absorption capacity of the r-GAs was evaluated by performing absorption tests with organic pollutants, gas and liquid, using gravimetric techniques.

REFERENCES

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