Temperature Influence of Production of Single and Multilayer Graphene Oxide.

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Abstract

The discovery of the two-dimentional carbon material (graphene) by Geim and Novoselov [1] gathers the interest of research community in carbon allotropes as promising materials in a wide scenario of emerging technologies [2-4]. Recently, graphene oxide (single) and graphite oxide (multilayer), due to their properties, grow the curiosity's researchers for their potential use in energy sustainable technologies, such as photovoltaic, solar heater [4-5]. Our investigation is focused on modulating the properties of oxidized carbon materials modifying the synthetic conditions (see Figures), in the view of applicability on nanoscale. By using a few-steps method [6], two forms of carbon oxides are generated, i.e. single or multilayer, which are function of the operating temperature. Even if apparently similar, these materials exhibit distinctive physical and chemical properties with a specific reactivity which affects the characteristic of possible future applications. Archived behaviours suggest a context where the properties needed for a material can be straightforward obtained by modifying the temperature. Moreover, the final oxidized products can be modified when another carbon allotrope (e.g. single wall material) is used. All of these materials raise the prospect of an advantage owing to the feasibility of modulate/engineering the properties and the low cost and scale up production.

References

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Figures