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Chemical methods of synthesis and reduction of graphene oxide

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Graphene has received significant recent attention due to its outstanding properties such as high electrical conductivity and mechanical strength.. Therefore, many strategies of its synthesis have been conceived in order to make its production cheaper and in larger quantities[1]. Among them, chemical approach is the most suitable as it allows to produce graphene sheets without the use of advanced equipment which makes it a low-cost route to obtain considerable quantities of graphene.

At present, the most common method is based on the Hummers method followed by the reduction of graphene oxide. However, the Hummers method produces the toxic gases and reactions might be highly exothermic and explosive. For this reason, the modifications of this traditional

Fig.1. Structure of graphene oxide [1]

method are needed to insure the safety as well as biocompatibility of the as-obtained materials[3]. In our work, we modified the Hummers method in many different ways and compared the results. We also used several reducing agents to reduce GO and characterized the graphene oxide and the reduced graphene oxide using spectroscopic methods such as UV-Vis and IR spectroscopy.
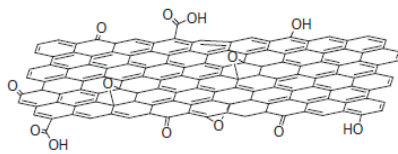
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