

Synthesis of Grapheme Oxide and Dye Removal Using GO

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ABSTRACT

In this paper the nanoparticle was prepared and concerned for adsorption properties. The prepared GO was applied to adsorption capacity of an anionic dye CONGO RED (CR).

The better potential of preparing graphene is in many fields but the synthesis of large quantities of graphene is a big challenge to make it environmentally friendly. The study of prepared nanoparticle from waste material has controlled the environment and revealed the good properties of absorption. Graphene is a material of sp^2 hybridization carbon atoms that has unique properties including, magnetic and thermal conductivity, mechanical properties as well as large surface area. The mixture of H_2O_2 and aqua regia with graphite flakes is used to the synthesis of graphene oxide. The Parameter such as reaction time, reaction temperature, and amount of concentration were varied to the study the degree of oxidation of graphite to graphite oxide. The result showed that treating graphite powder with H_2O_2 and a mixture of concentrated acid for a few hours gives a better result. Whereas Graphene oxide (GO) and its derivatives have the ability to adsorption capacities for dyes removal. The study of adsorption properties of GO the effects of solution pH, concentration of the dye, adsorption time and temperature on adsorption capacity of RGO were also work.

INTRODUCTION

The source required for human survival is water. Concerns about water resource contamination have recently gained worldwide attention. The most pollutant in the group of industry is textile wastewater. The textile industry produces large amounts of wastewater that is usually dyed. The widespread release of synthetic dye into operations is causing the environmental impact (Zhang *et al.* 2023). The most common dyes are used in paper, cosmetics. Textiles are methyl blue (MB) (Deng *et al.* 2013) (Jing *et al.* 2023). Several methods are used to improve the drinking water and efficiently manage the wastewater like physical and chemical process i.e.; adsorption, ion exchange, oxidation, organic resin etc. These techniques are effectively used to improve the dyes from contaminated water.

METHODOLOY

Formation of GO was performed using following method:

Take 3gm of graphite flakes obtained from graphite pencil. Add 4ml aqua regia in the graphite flakes. Stir the mixture for 5 hours. Now add reducing agent H_2O_2 in a mixture and further stir the solution for 5 hours. Filter the stuff and neutralize the solution.

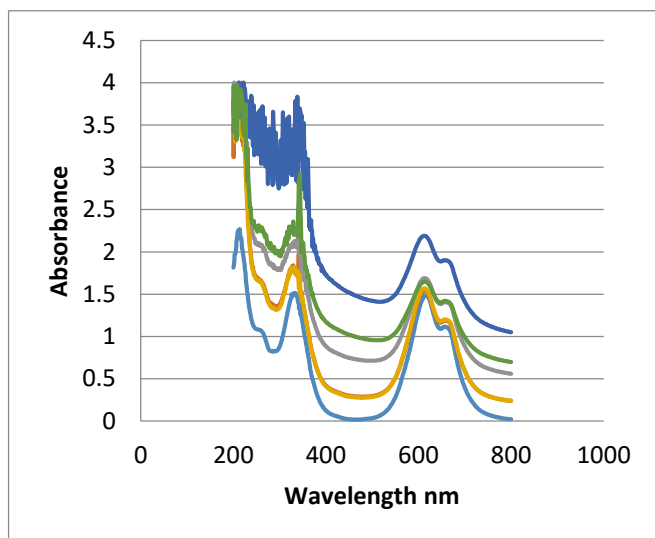
METHOD USE FOR DYE REMOVAL

Take a different amount of GO in a separate container and add a constant volume of dye. Now, stir for 30 minutes after stirring and filter the mixture. Collect the spectra of filter dye solution using spectrophotometer.

RESULT

Through the light based adsorption, the dyes degrade greatly and we'll provide a straightforward and environment friendly method to produce nontoxic compounds. The field of photocatalysis carbon-based materials including graphene, graphene nanotubes and graphitic carbon nitride has promising to improve the wastewater. Magnetic nanoparticles have been working intensively to clean up the environment for the reason of great dissolution. One of the easiest methods for synthesis dye is to reduce graphene oxide which is a great

study for its application. The excellent ability of the absorption of the toluidine blue and Congo red (CR and TB) than other pores performances (Travlou *et al.* 2013).



CONCLUSION

In conclusion graphene oxide is a derivative of graphene, consisting of a single layer of carbon atom densely packed into a two dimensional lattice structure. Graphene oxide is a versatile nonmaterial with remarkable properties and is useful for many applications. There is still a risk related to its toxicity limiting its uses in material science, nanotechnology, electronics and biomedicine. Because of its special quality of graphene oxide can be used for a variety of applications. It may be possible to use this green carbon material to detect other molecules that are positively charged. Analysis was done on the TB and CR dye solutions deterioration. Under the UV and visible light irradiation TB dye approval rates up to 97% and 96%, respectively. The generated nanocomposite extremely reveals the strong degradation of TB and CR when exposed to visible light that makes it suitable for treating industrial wastewater.

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