The effect of hole-electron for decolorization of dyes by using nanomagnetic compound

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The Graphene oxide (GO) has a plethora of composites which are constitutes by various nanomaterials like Fe_3O_4 as a strong nanomagnetic compounds and could increase the properties of both materials correlatively which have been used for many ends such as drug delivery systems, electronic devises, and wastewater treatments these days. The photocatalytic activities of Fe_3O_4-GO nanocomposites were observed under UV and visible light illumination. The removal yields of Reactive Red 198 (RR198) at various conditions are showed approximately 100% of RR198 was degraded during 60 min in the presence of photocatalysts due to UV-induced with assist of hydrogen peroxide to photolysis of dye and a negligible decreases in dye concentration was obtained afterwards which are depicted in fig. 1 and fig. 2 . Near 100% of the dye was decolorized under UV exposure in different samples which were arranged to examine in order to explore modify condition for decolorization. According to these samples, The RR198 was examined by different conditions which were observed: RR198/UV, Fe_3O_4-GO/UV, H_2O_2/UV, Fe_3O_4-GO/H_2O_2-UV, and Fe_3O_4-GO/H_2O_2-visible light, Fe_3O_4-GO/visible light, and H_2O_2-visible light. The Fe_3O_4-GO behave as a strong photocatalyst could create hole-electron on its surface and produce the free radical of hydroxyl on its surface and assist to augment and intensify severely the effect of decolorization in aqueous solutions. Decolorization is not only arrange with a low dosage of H_2O_2 in volume but also it is equipped by low power of UV irradiation in only 25W. The Fe_3O_4-GO could produce •OH and $\bullet O_2^-$ which are assisted indirectly to disappear the RR198 easily. Fe_3O_4-GO manners such a strong photocatalyst to remove RR198 under UV and in absence of UV irradiation which are discovered by these examinations and methods.

Keywords: Fe3O4-GO, decolorization, nanomagnetic compound.

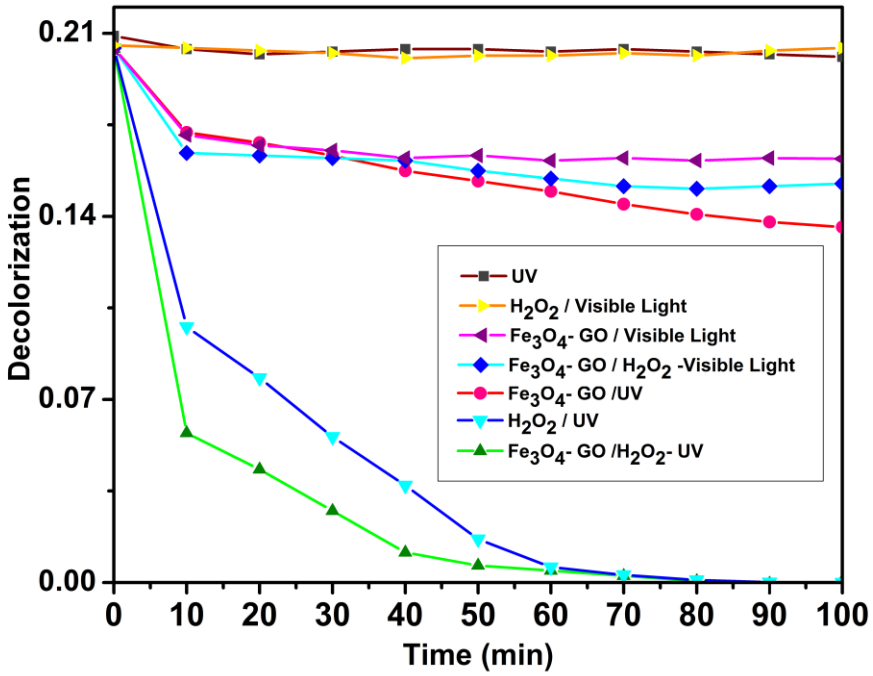

Fig. 1. The UV irradiation of RR198 with various conditions during 100 min.

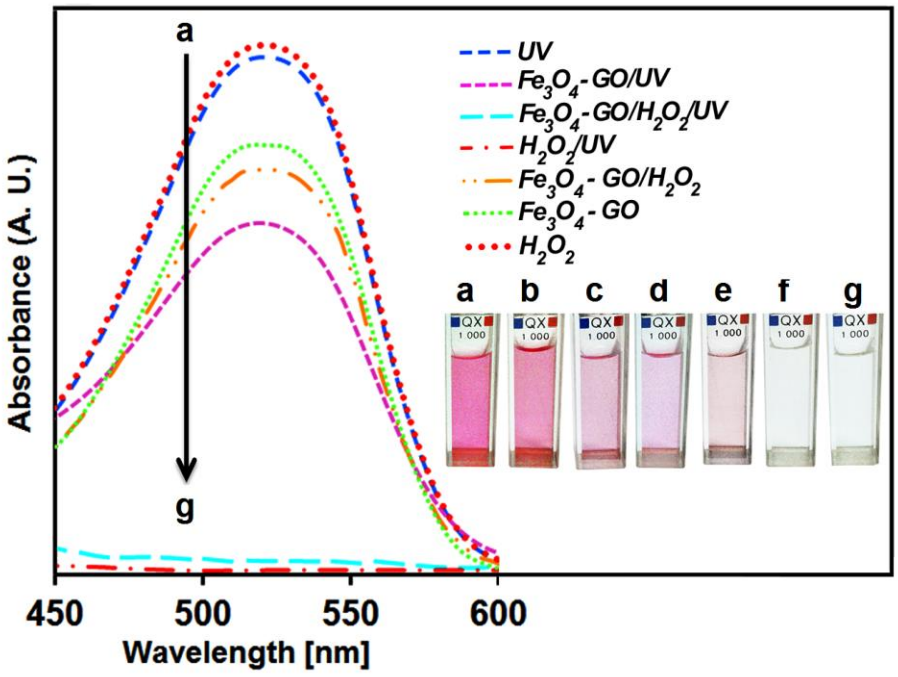

Fig. 2. The UV-Vis spectroscopy and Decolorization of RR198 in different conditions.