**Synthesis of CoFe2O4/SGO Nanocomposite for H2O2 Assisted Visible Light**

**Driven Photocatalytic Degradation of Cationic and Anionic Dyes**

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Scarcity of hygienic drinking water stimulates the need to develop new and effective methods for water remediation. Dyes, one of the major water pollutants are also toxic, carcinogenic and harmful not only for human and animals but also for aquatic flora and fauna. Therefore, on site degradation of dyes in wastewater is an important research concern and many new techniques have been put forwarded. Among these, photocatalytic degradation has emerged as a highly effective tool and many studies have been reported till date. However, these techniques suffer many drawbacks like high band gap energy, low oxidation power, difficulty in separation from the reaction mixture and other disadvantages in their synthesis process like low pH and high temperature requirement. Spinel ferrites, MFe2O4 (M= Mn, Co, Ni, Cu, Zn, etc.) have narrow band gap energy, high magnetic property and additional catalytic sites that enhance their photocatalytic efficiency. However, they have an agglomeration tendency and this inhibits their inherent properties to a great extent. Graphene in pristine as well as in surface functionalized form could be used as a catalyst support to reduce the agglomeration of the ferrite nanocatalyst. Taking into consideration the advancements required, we report here the synthesis of cobalt ferrite-sulphonated graphene nanocomposite for the photocatalytic degradation of cationic and anionic dyes viz. MO, MR and MB. The as prepared photocatalyst exhibits outstanding efficiency in the degradation of these dyes in the presence of H2O2. The high efficiency of these nanocomposite may be primarily ascribed to the formation of e-/h+ pair and strong interfacial coupling between CoFe2O4 and SGO nanoparticles.

Keywords: catalysis, cobalt ferrite, dyes, degradation, sulphonated graphene oxide.

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