

# Photocatalytic Degradation Of Phenolic Compounds

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## Abstract

A great challenge for this century lies in cleaning-up the wastewater generated during industrial, domestic and agricultural activities before being released, into the aquatic environment, or reused for another purpose e.g. irrigation. Phenolic compounds among the various organic contaminants found in wastewater require special attention because of their toxic effect on humans and the environment. Their presence has been confirmed in many different industrial wastewaters. These phenolic compounds are refractory ones and the efficiency of their traditional treatment techniques is low. Therefore, the use of an effective and economic elimination technique for phenolic compounds in wastewater becomes an urgent demand.

Advanced oxidation processes (AOPs) represents the most recent technology in wastewater treatment. TiO<sub>2</sub> is known to be an excellent photocatalyst. However, there are some challenges regarding using TiO<sub>2</sub> in the industrial scale. Significant attention is directed towards using carbonaceous nanomaterials as support to enhance photocatalytic behavior of TiO<sub>2</sub> due to their unique and controllable structural and electrical properties.

In this work, low percentage of reduced graphene oxide (RGO) and graphene oxide (GO) were supported on TiO<sub>2</sub> seeking a better catalytic performances. These composites were tested for degrading some phenolic compounds using UV as photoexcitation source in presence of some oxidants e.g. H<sub>2</sub>O<sub>2</sub>. It was found that small loadings of GO and RGO decreased the band gap energy for TiO<sub>2</sub> and increased the efficiency and decreased the time needed for the photodegradation of phenolic compounds.