

## SYNTHESIS OF PHOTOCATALYSTS BASED ON GRAPHENE OXIDE AND Fe<sub>3</sub>O<sub>4</sub>

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**Abstract.** *Organic synthetic dyes that are used by the textile industry, due to their high stability, lead to harmful effects for humans and animals using polluted water sources. Most dyes widely used, such as methylene blue, bromphenol blue or other phenolic compounds, when discharged into the environment in greater amounts, can cause serious contamination of the water sources they reach. Simple and fast systems are needed to help eliminate these drugs from the environment. Graphene is a material made up of a single layer of sp<sup>2</sup> hybridized carbon atoms, which has become one of the most researched materials ever since its discovery. Applications of graphene materials are variate, from solar cells to sensors, water treatment, and even cancer therapies. This study is focus on the preparation of GO@Fe<sub>3</sub>O<sub>4</sub> composites with different morphologies and sizes, obtained by the precipitation method and used for environmental depollution.*

**Keywords:** nanocomposite, water treatment, graphene oxide, magnetite, separable photocatalysts.

### 1. Introduction

Environmental pollution is the main problem of the 21<sup>st</sup> century. Technological advancement and product diversification raise the problem of efficient recycling and elimination of the main pollutants in the environment. The pharmaceutical industry represents a pollution factor by introducing in the aquatic environment some traces of medicines of which the most common are antibiotics. Also, the textile industry produces a series of organic pollutants such as methylene blue [1]. This is a cationic dye known also as methylthioninium chloride used to impregnate the blue color of textiles. It can also be used in the pharmaceutical environment especially for veterinary use.

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