



Advancing Sustainable Graphene-Based Nanomaterials for Environmental Solutions

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Abstract

Green synthesis, synthesis of nanomaterials via different biological sources involving plants and microorganisms, is sustainable, environmentally eco-friendly method which helps to eliminate toxic waste. We have prepared more than 70 nanocomposites with different derivatives of graphene (GO, rGO) and *p*, *d* and *f* block metal/metal oxides and their nanocomposites using plant extracts and microbes via two different green methods, green one pot method and green deposition method. These nanocomposites were prepared for their applications in degradations of pollutants coming out from textile, pharmaceutical, pesticides, fertilizers and chemical industries [1-4].

Graphene has got much attraction in recent years and is considered one of the most promising nanomaterials because of its exceptional properties and applications. Graphene oxide (GO) and reduced graphene oxide (rGO), derivative of graphene, are prepared from graphite by using variety of methods. GO and rGO are different from each other due to their C/O ratio, surface area, dispersibility, hydrophobicity, and electrical conductivity. Surface of GO and rGO is further modified with the doping of metal and metal oxides nanoparticles to enhance their chemical and biological activities to remove environmental pollutants from chemical and pharmaceutical waste water.

Keywords: Graphene, nanocomposites, antibiotics, degradations, pollutants, pesticides, wastewater

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