

Effective Removal Of Antibiotics From Wastewater Using Deep Eutetic Solvent- Grafted On Graphene Oxide Adsorbents

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Abstract

The escalating prevalence of antibiotic residues in wastewater constitutes a grave environmental concern, contributing to antibiotic resistance and negatively impacting aquatic ecosystems. Current treatments are often energy-intensive or ineffective at removing low concentrations of antibiotics¹. This study investigates an innovative, cost-effective approach to tackle this problem by using adsorbents² created from deep eutectic solvents (DES) grafted on graphene oxide (GO).

We synthesized the GO-based adsorbents using eco-friendly green solvents-based thymol for employing surface modification techniques to enhance hydrophobic interactions between the antibiotic molecules and the adsorbent. The synthesized adsorbents were characterized through Fourier-Transform Infrared Spectroscopy (FTIR), UV-Vis Spectroscopy, Total Organic Content (TOC), Scanning Electron Microscopy (SEM), and X-ray Diffraction (XRD). Batch adsorption experiments were conducted using different classes of antibiotics such as Meropenem and Ciprofloxacin at various concentrations. The study thus presents a viable, environmentally benign method for antibiotic removal from wastewater, opening avenues for large-scale applications in wastewater treatment facilities.

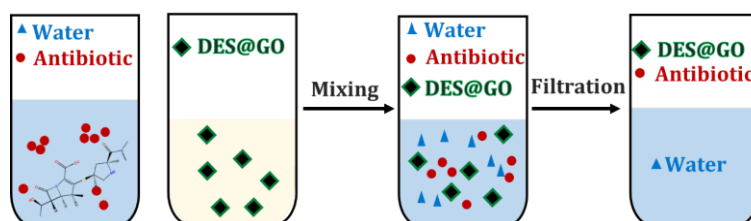


Figure 1: Schematic diagram for the adsorption and removal of Antibiotic from waste water by using DES@GO adsorbent.

References

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