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# Investigation of Porphyrin-Based Porous Organic Polymers for Enhanced Ciprofloxacin Adsorption from Water

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In recent times, the contamination of groundwater has emerged as a significant environmental concern, primarily due to the presence of diverse pollutants resulting from improper personal usage. Antibiotics, being a class of organic substances, possess inherent resistance to biodegradation. Unfortunately, their widespread and irregular usage has led to the pollution of groundwater, contributing to concerns such as bacterial resistance and elevated toxicity levels within underground reservoirs [1]. Among the various antibiotics, Ciprofloxacin, a commonly prescribed Fluoroquinolone antibiotic, stands out as one of the most extensively used. Unfortunately, this antibiotic exhibits a prolonged presence in municipal wastewater and even low concentrations of it can have toxic effects. In response to this concern, numerous methods have been developed to remove antibiotics from groundwater or wastewater [2]. One such approach involves the adsorption of antibiotics using porous materials. Porous Organic Polymers (POPs) have garnered significant interest due to their distinctive properties. These materials feature interconnected porous structures held together by covalent bonds, offering advantages such as a large specific surface area, exceptional chemical stability, and low skeleton density [3].

This study focuses on the application of a Porphyrin-based Porous Organic Polymer (POP) for the removal of Ciprofloxacin from wastewater. The synthesized porous organic polymer incorporates Porphyrin groups and exhibits a notable specific surface area of 594 $m^2g^{-1}$. Iron is coordinated to the POP to produce poly iron porphyrins. Experimental findings demonstrate that the optimal adsorption of Ciprofloxacin (>40%) takes place under acidic conditions, specifically at a pH of 3. Overall, this research highlights the potential of utilizing a high-specific surface-area porous organic polymer as a green and cost-effective adsorbent for the removal of antibiotics from water. The polymer demonstrates promising performance, particularly in acidic solutions.

***Keywords:*** Porous Organic Polymers, Adsorption, Ciprofloxacin

**References**

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