

ADSORPTION OF EMERGING POLLUTANTS WITH DIFFERENT BIOCHAR ADSORBENTS

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Due to environmental contaminants discharge from industrial, residential, and commercial sources, the ecology has deteriorated today. The term “emerging pollutants (EPs)” refers to harmful and hazardous contaminants that can have negative effects even at very low concentrations. A number of medications and dyes are considered EPs in the aquatic ecosystem. In many cases, these substances are stable and cannot be effectively eliminated from wastewater treatment plants using traditional treatment methods. Thus, different or additional techniques must be used.

The adsorption process, which has been extensively explored recently, is one of the options that has a lot of promise for application due to its simplicity, affordability, and adaptability. As sorbents for adsorption, a variety of carbon and carbonaceous materials – activated carbon, carbon nanotubes, biochar, graphene oxide, and so on – have been widely used. Among them, biochar has garnered the most attention. Biochar is a carbon-rich solid product produced from thermochemical conversion of biomass under oxygen-restricted atmosphere. Due to the vast availability of parent biomasses, substantial surface area, well-developed pore structure, environmental friendliness, and low cost of biochar, it has been demonstrated as a potential sustainable and cost-effective sorbent. Additionally, the extensive applications of biochar as a substitution of commercial activated carbon present a chance for its commercialization.

This study aims to evaluate the adsorption performance of different adsorbents to remove dyes (methyl orange and methylene blue) and pharmaceuticals (acetaminophen, ibuprofen, amoxicillin, and tetracycline) from aqueous media. The adsorption behaviors including the adsorption kinetics, isotherms, mechanisms were evaluated. Also, comparison with commercial activated carbon was made.