



Processing of natural fibre and method improvement for removal of endocrine-disrupting compounds

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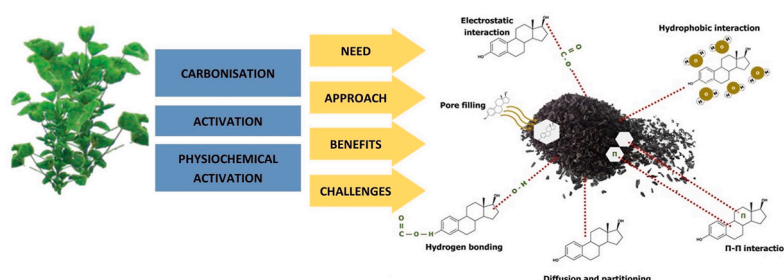
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HIGHLIGHTS

- Removal mechanisms for different organic contaminants are reviewed.
- Agro-biomass biochar is an effective adsorbent for removing organic contaminants.
- Elimination trends of EDCs evaluated in terms of types, processes, and mechanisms.
- Natural adsorbent is analysed based on Needs, Approaches, Benefits and Challenges.

GRAPHICAL ABSTRACT



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ABSTRACT

Persistent endocrine-disrupting compounds (EDCs) in bodies of water are a concern for human health and constitute an environmental issue, even if present in trace amounts. Conventional treatment systems do not entirely remove EDCs from discharge effluent. Due to the ultra-trace level of EDCs which affect human health and pose an environmental issue, developing new approaches and techniques to remove these micropollutants from the discharged effluent is vital. This review discusses the most common methods of eliminating EDCs through preliminary, primary, secondary and tertiary treatments. The adsorption process is favoured for EDC removal, as it is an economical and straightforward option. The NABC aspects, which are the need, approach, benefits and challenges, were analysed based on existing circumstances, highlighting biochar as a green and renewable adsorbent for the removal of organic contaminants. From the environmental point of view, the effectiveness of this method, which uses natural fibre from the kenaf plant as a porous and economical biochar material with a selected lignocellulosic biomass, provides insights into the advantages of biochar-derived adsorbents. Essentially, the improvement of the natural fibre as an adsorbent is a focus, using carbonisation, activation, and the physicochemical process to enhance the adsorption ability of the material for pollutants in bodies of water. This output will complement sustainable water management approaches presented in previous studies for combating the emerging pollutant crisis via novel green and environmentally safe options.

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