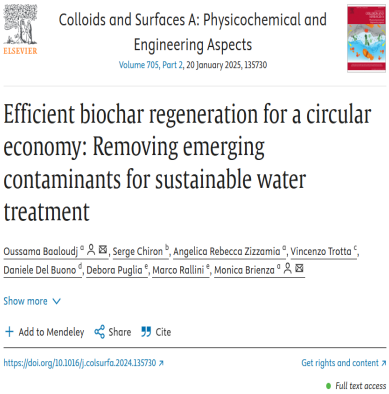

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Oussama Baaloudj [a], Serge Chiron [b], Angelica Rebecca Zizzamia [a], Vincenzo Trotta [c], Daniele Del Buono [d], Debora Puglia [e], Marco Rallini [e], Monica Brienza [a]

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Regenerating Biochar for Sustainable Water Treatment

Description

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A recent study published in *Colloids and Surfaces A: Physicochemical and Engineering Aspects* presents new findings on the use and regeneration of **biochar derived from forest residues** for the removal of emerging contaminants from water systems. Conducted within the framework of the **PRIMA-SAFE** project, the research focused on four common pollutants: **fipronil**, **venlafaxine**, **sulfamethoxazole**, and **trimethoprim**. These compounds are frequently found in wastewater and are recognized for their persistence and potential environmental impact.

Key Findings

- Biochar effectively adsorbed all target pollutants, reaching capacities of up to **3.88 mg/g**.
- **Heat-activated persulfate (PS+T)** was the most efficient regeneration method, preserving **high adsorption performance over five cycles**

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- Post-regeneration analyses confirmed the **structural stability and functional integrity** of the biochar, supporting its long-term usability.

Implications

This work demonstrates the feasibility of integrating **low-cost, renewable biochar** into sustainable water treatment practices. Its regeneration via PS+T represents a viable path to reduce waste, extend material lifespan, and contribute to a **circular economy** approach in environmental remediation.

Reference

Baaloudj O., Chiron S., Zizzamia A.R., Trotta V., Del Buono D., Puglia D., Rallini M., Brienza M. (2025). *Efficient biochar regeneration for a circular economy: Removing emerging contaminants for sustainable water treatment*.
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