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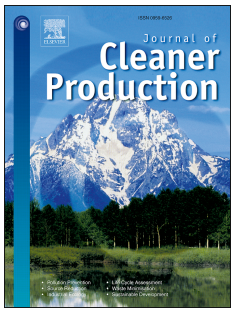

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The potential for the use of waste products from a variety of sectors in water treatment processes

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Abstract

This review examines the utilisation of waste products from three sectors (industry, agriculture, and construction and demolition) in filters for the removal of contaminants from water. Sand is commonly used in drinking water filtration in water treatment plants. However, the use of alternative, low-cost materials could address the limitations of sand, particularly for the removal of emerging contaminants, and address European legislation which fosters the development of a 'circular' economy, in which materials are used effectively. This review assesses the suitability of potential media by quantifying their adsorption potential across a variety of common drinking water contaminants. The media investigated were fly ash, Bayer residue, ground granular blast furnace slag, coconut shell, tea/coffee waste, rice husk, crushed concrete, masonry waste, and wood waste. There is a potential for the use of these media in the water treatment sector, although certain precautions must be taken to ensure any concerns are mitigated, such as release of metals into water. Recommendations, following this review, include testing the media in large-scale applications, and also constructing filters so as potential media are placed in layers to harness their contrasting adsorptive potentials.