Novel Adsorbent for Removing Pollutants from Water

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OVERVIEW

Cellulose-based adsorbent for removal of PFAS from water

- Inexpensive, disposable solution derived from waste product
- May be used in household filtration, municipal water treatment, and environmental remediation

BACKGROUND

Perfluoroalkyl and polyfluoroalkyl substances (collectively referred to as PFAS) are a class of chemicals that have become a serious environmental concern due to their resistance to biodegradation. Having been used for decades in common products and manufacturing processes, PFAS contamination is now widespread in soil, sediment, surface water, and groundwater. A staggering 98% of the US population has measurable levels of PFAS in their blood. Increased awareness and potential changes to federal regulations of PFAS contamination has led to a high demand for the development of detection and treatment technologies. Although PFAS removal solutions employing various adsorption technologies are currently on the market, these systems require long operation times, foul easily due to a lack of specificity, and are insufficient for certain types of PFAS.

INNOVATION

Researchers at the University of Michigan are developing technology based on the chemical modification of cellulose-based adsorbents to remove PFAS contamination from water. The cellulose starting material is a waste product, making the technology inexpensive, biodegradable, and an attractive alternative to current adsorbents which can be costly and environmentally unfriendly. The economics of this solution are so favorable that regeneration of PFAS-saturated material may not be required, which would dramatically simplify the product use and lifecycle. The technology is easily optimized to attract specific classes of PFAS, such as cationic and anionic species. The preliminary adsorption data for this technology is promising and highlights its potential for use within a variety of market sectors including household filtration, municipal water treatment, and environmental remediation.

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Materials
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