SYNTHESIS OF SUSTAINABLE ARECANUT ADSORBENT FILM

PVA
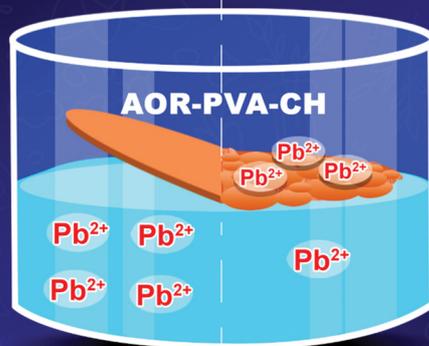
AOR

CH

PVA+AOR+CH

AOR-PVA-CH

Film Casting

LEAD ADSORPTION PROCESS

AOR-PVA-CH

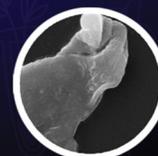Pb²⁺ Pb²⁺ Pb²⁺ Pb²⁺ Pb²⁺ Pb²⁺ Pb²⁺ Pb²⁺

Profilometry

Profilometry
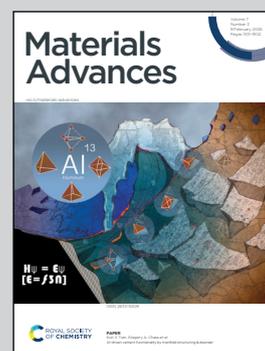
SEM
Before Adsorption

SEM
After Adsorption

Showcasing research from Dr Vijayasankar AV's laboratory, Department of Chemistry, Christ University, Bangalore, India.

Sustainable fabrication of arecanut waste-based polymer blend adsorbents for enhanced lead(II) ion removal from water

This study presents a green and sustainable route for converting arecanut agricultural waste into efficient polymer blend adsorbent for Pb(II) removal from water. Incorporation of arecanut organic residue into a PVA–chitosan matrix enhances surface functionality and strengthens metal–ion interactions through hydroxyl and amine groups. The resulting films display improved adsorption capacity, favourable Langmuir isotherm behaviour, and rapid pseudo-second-order kinetics. Stable performance under optimized conditions highlights the potential of this low-cost, eco-friendly adsorbent for sustainable lead remediation in water systems.

Image reproduced by permission of Vijayasankar A.V. from *Mater. Adv.*, 2026, **7**, 1432.

ROYAL SOCIETY OF CHEMISTRY

rsc.li/materials-advances