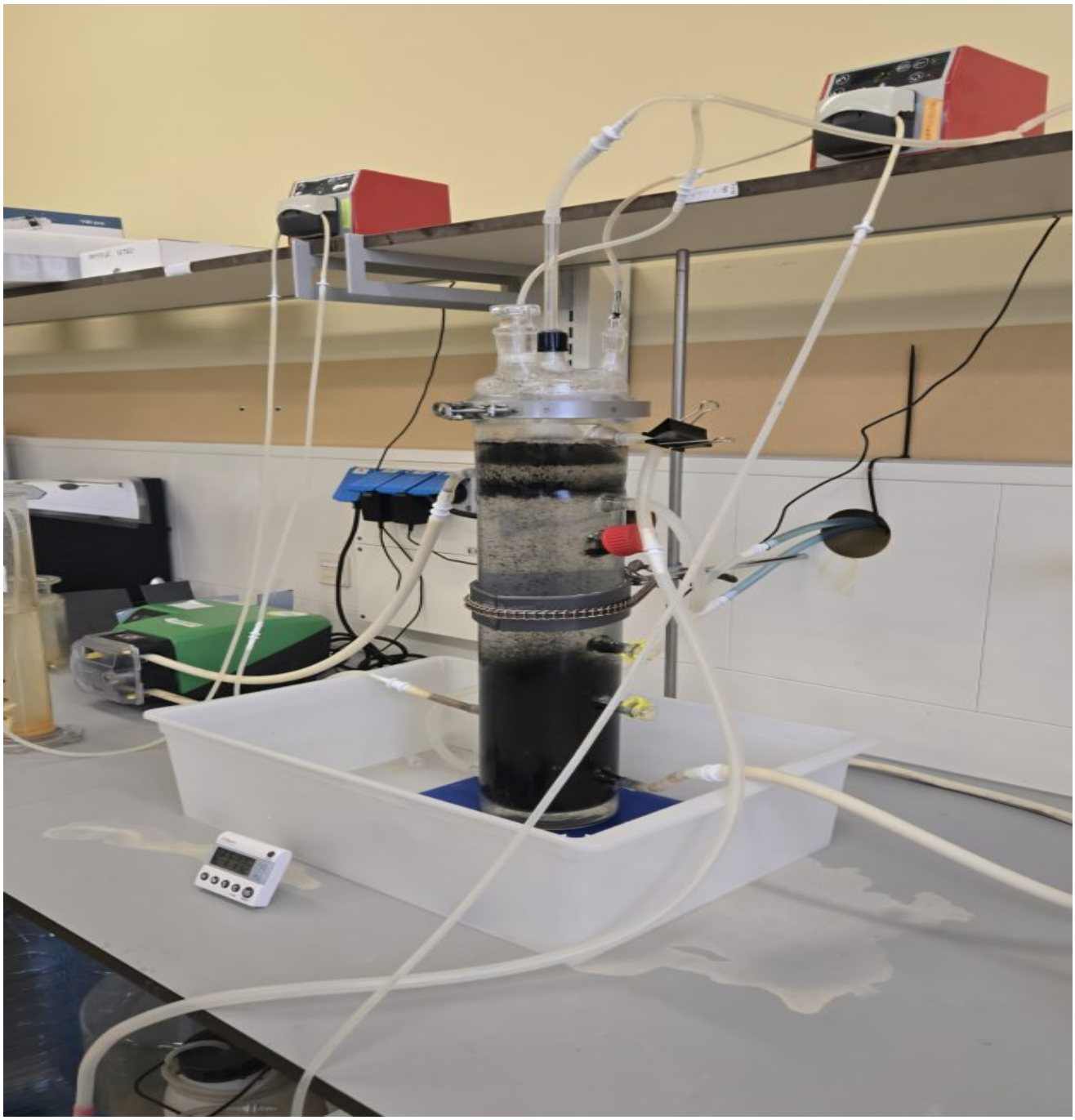
Innovative Water Treatment Collaboration: SAFE UNIBAS and CNR-IRSA Meeting

Description

The research teams from Università degli Studi della Basilicata (UNIBAS) and the Water Research Institute of the National Research Council (CNR-IRSA) recently held a collaborative meeting to discuss advancements in wastewater treatment technologies. The focus of this meeting was the development of a novel two-step treatment process aimed at improving water quality and promoting resource recovery.

Highlights



1. Integration of Granular UASB and Biochar Adsorption

Granular Up-flow Anaerobic Sludge Blanket (UASB) Reactors: UASB reactors are cutting-edge systems for anaerobic wastewater treatment. They work by promoting the formation of dense microbial granules capable of efficiently degrading organic pollutants. The up-flow design maximizes the contact between wastewater and these microbial granules, enabling high treatment efficiency and the production of biogas as a renewable energy source.

Biochar Adsorption: The second stage of the process employs biochar, a highly porous, carbon-rich

material produced via biomass pyrolysis. Biochar is renowned for its excellent adsorption properties, making it highly effective in capturing residual organic contaminants, micropollutants, and heavy metals that may persist after primary treatment. This step enhances the treated water's quality, making it suitable for safe reuse in agriculture and other applications.

The integration of these two technologies provides a synergistic effect, combining the high organic pollutant removal efficiency of UASB reactors with the superior adsorption capability of biochar for micropollutant and heavy metal removal.

2. Resource Recovery from Wastewater

This collaborative effort also emphasizes the sustainable recovery of resources from wastewater streams. UASB reactors produce biogas during the anaerobic digestion process, which can be harnessed as a renewable energy source. Additionally, nutrients like phosphorus and nitrogen present in wastewater can be recovered and utilized as fertilizers, contributing to a circular economy approach in wastewater management.

3. Addressing Emerging Micropollutants

Micropollutants, including pharmaceuticals, pesticides, and personal care product residues, pose significant challenges for wastewater treatment systems. The integration of biochar adsorption in the proposed two-step treatment process enhances the removal of these persistent contaminants, ensuring the treated water meets stringent safety standards for environmental discharge or agricultural reuse. This advancement has the potential to mitigate the environmental risks associated with micropollutant accumulation in ecosystems.

This collaboration between SAFE UNIBAS and CNR-IRSA demonstrates the potential of combining advanced treatment technologies with resource recovery strategies to address pressing environmental challenges in water management. The two-step approach highlights a forward-thinking vision for wastewater treatment that prioritizes sustainability, resource efficiency, and environmental safety.

Category

1. Senza categoria

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