Patent Search

Invention Title	Greywater Management System (Eco Cycle)
Publication Number	20/2026
Publication Date	15/05/2026
Publication Type	INA
Application Number	202641057368
Application Filing Date	06/05/2026
Priority Number	
Priority Country	
Priority Date	
Field Of Invention	CHEMICAL
Classification (IPC)	C02F 1/463, C02F 9/06, C02F 1/461, C02F 1/469, C02F 9/00

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Abstract:

The present disclosure relates to systems and methods, and provides an Eco-Cycle Hybrid Electrochemical and Filtration-Based Greywater Purification System (100) c integrate electrocoagulation, filtration, and disinfection processes to purify wastewater for reuse. The greywater purification system (100) includes a preliminary scre (102) for removing large particulate matter, an electrocoagulation chamber (104) housing aluminum electrodes (106) energized by a DC power supply (108), and a mu filtration unit (110). The greywater purification system (100) is configured to integrate electrocoagulation, filtration, and disinfection processes to purify wastewater fo response to continuous operation. This configuration provides a cost-effective, energy-efficient, and environmentally sustainable solution for greywater reuse in non- applications.

Complete Specification

Description:TECHNICAL FIELD
[001] The present invention relates to the field of wastewater treatment and environmental engineering, and more particularly to an Eco-Cycle A Hybrid Electrocher and Filtration-Based Greywater Purification System utilizing electrocoagulation, multi-layer filtration, and disinfection techniques for the purification and reuse of dc wastewater.
BACKGROUND
[002] The field of wastewater treatment and environmental engineering has seen significant development in recent years, particularly in the management and reus domestic wastewater. Among the various categories of domestic wastewater, greywater — generated from household activities such as washing, bathing, laundry, a general cleaning — constitutes a substantial proportion of total residential water discharge. With accelerating urbanization and the growing stress on freshwater re globally, the treatment and reuse of greywater has attracted considerable attention from researchers, engineers, and policymakers seeking sustainable water mana strategies.
[003] Conventional greywater treatment systems have typically relied upon biological treatment processes, including aerobic and anaerobic digestion, constructed wetlands, and rotating biological contactors. While such biological methods may achieve acceptable removal of certain organic compounds under controlled condit they typically require large infrastructure footprints, extended hydraulic retention times, and skilled operational oversight. These characteristics may render biologic treatment systems unsuitable for decentralized, household-level, or small-scale commercial deployment, where spatial and operational constraints are significant.
[004] Chemical coagulation has also been employed as a treatment approach, wherein chemical coagulants such as alum or ferric chloride are dosed into wastewat

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