Biosurfactant Nano-Ferric Ionosphere Scaffold for Landfill Leachate Treatment

CATEGORY OF INVENTION:

Environmental Engineering
Nanotechnology
Biotechnology
Green Chemistry

TECHNOLOGY READINESS LEVEL (TRL)

TRL: 6

INTELLECTUAL PROPERTY

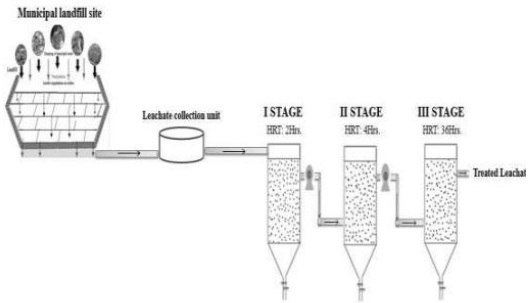
379986

PROBLEM ADDRESSED

- Persistent pollutants contaminate groundwater and pose serious environmental and health risks.
- Conventional methods fail to treat toxic and recalcitrant compounds in landfill leachate.
- Biological and chemical treatments are inefficient and often produce secondary pollution.
- Existing systems require long treatment times and large infrastructure.

ABOUT THE TECHNOLOGY

The Biosurfactant Nano-Ferric Ionosphere Scaffold (BN-FIS) is an advanced, high-surface-area magnetic scaffold that sequesters and oxidizes contaminants, reducing chemical oxygen demand (COD) by over 99% while preventing secondary pollution. This cost-effective technology supports large-scale wastewater treatment applications.



USP

- Particle size: 15–20 nm
- Magnetic recoverability
- Recyclable up to 10 cycles
- Dual functionality: sequestration + oxidation

ADVANTAGE

- Recyclable nanoscaffold reduces operational cost
- No secondary sludge generation
- Scalable, energy-efficient, and modular
- Short Hydraulic Retention Time (HRT): ~42 hours
- Suitable for municipal, industrial, pharmaceutical, and tannery leachate

MARKET FORECAST

- 2023 market size: approx. USD 5.1 billion
- Forecast: expected to reach USD 8.8 billion by 2032, growing at a CAGR of ~6.25% (2024–2032)

Ref:wiseguyreports.com

Potential Users

- COD reduced from 18,930 ppm to 220 ppm
- Ammoniacal nitrogen reduced from 1,624 ppm to 112 ppm
- Complete removal of lignin and other recalcitrants confirmed via GC-MS

Contact Us

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