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(57) Abstract :

The invention relates to a bioremediation system and method in the field of water treatment, employing a microbial consortium comprising iron-oxidizing bacteria, including the isolate IOB-1, immobilized via a liquid agar binder on pre-treated coarse sand. The system features a reactor configuration with a container designed to receive iron-contaminated water, equipped with agitation means and temperature control maintained at approximately 30°C, and incorporates one or more sampling ports for periodic water collection. The method involves enriching and screening environmental samples to form the consortium, immobilizing the bacteria on the carrier material, and catalyzing the oxidation of ferrous iron (Fe²⁺) to ferric iron (Fe³⁺) for efficient water purification.

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