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(57) Abstract :

[032] The invention discloses a low-cost, energy-efficient electro-chlorination reactor for onsite drinking water disinfection using naturally occurring chloride ions in tap water. The system comprises a rectangular poly(methyl methacrylate) cell equipped with six cylindrical graphite anodes and six stainless steel cathodes arranged alternately with optimized spacing and overlap to enhance electrochemical efficiency. Operating at a low current density of 1.5 mA/cm², the reactor generates up to 2.5 mg/L of active chlorine with minimal energy consumption (0.083 kWh/m³) and without altering the pH of the treated water. The use of inexpensive, stable electrode materials and the reactor's simple, scalable design make it particularly suited for decentralized, rural, and resource-limited water treatment applications. Accompanied Drawing [FIGS. 1-2]

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