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# In-situ biofilm removal from air cathodes in microbial fuel cells treating domestic wastewater

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**Abstract**

One challenge in using microbial fuel cells (MFCs) for wastewater treatment is the reduction in performance over time due to cathode fouling. An in-situ technique was developed to clean air cathodes using magnets on either side of the electrode, with the air-side magnet moved to clean the water-side magnet by scraping off the biofilm. The power output of the magnet-cleaned cathodes after one month of operation was 132 ± 7 mW $m^{-2}$, which was 42% higher than the controls with no magnet (93 ± 4 mW $m^{-2}$) (no separator, NS), and 110% higher (116 ± 4 mW $m^{-2}$) than controls with separators (Sp, 55 ± 7 mW $m^{-2}$). Cleaning cathodes using magnets reduced the biofilm by 75% (NS) and 28% (Sp). The in-situ cleaning technique thus improved the performance of the MFC over time by reducing biofouling due to biofilm formation on the air cathodes.

**Keywords:** MFC; fouling; cathode cleaning; wastewater