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Using three-bio-electrode reactor to enhance the activity of anammox biomass

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ABSTRACT

This research was designed to investigate the effects of different electric potentials (EPs) on the anammox biomass activity in a three-electrode reactor. Electric potential difference (EPD) of 0.08V between the working and reference electrodes showed the best nitrogen removal performance. Under the optimal EPD of 0.08V, the nitrogen removal rate of reactor 2 (R2, EP applied) reached 911 g-N/m³/d on day 188, which was 25.3% higher than that of reactor 1 (R1, the control). Moreover, the scanning electron microscope observation and extracellular polymeric substance analysis proved that EP application was conducive to the anammox cells growing onto the surface of electrode. Additionally, it was demonstrated that long-term EP application increased the crude enzymes activities and the cell quantities of the bio-electrode anammox reactor. Besides, transmission electron microscope observation proved the morphological variation of anammox biomass with continuous

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