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**Bioelectrochemical enhancement of direct interspecies electron transfer in upflow
anaerobic reactor with effluent recirculation for acidic distillery wastewater**

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Abstract

Methane production in the upflow anaerobic bioelectrochemical reactor (UABE) treating acidic distillery wastewater was compared to the upflow anaerobic sludge blanket reactor (UASB), and the electron transfer pathways for methane production were also evaluated in the effluent recirculation. The methane productions from reactors were influenced by the low pH of influent wastewater. However, the methane production rate and yield of the UABE were 2.08 L/L.d and 320 mL/g COD_r, which were higher than the UASB. The effluent recirculation containing alkalinity neutralized the acidic influent and increased the upflow velocity in both reactors, and improved the direct interspecies electron transfer more in the UABE. When the effluent recirculation ratio was 3.0 in the UABE, the methane production rate and yield were reached up to 3.88 L/L.d and 501.0 mL/g COD_r, respectively. The UABE requires electrode installation

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