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Abstract

The anaerobic treatment of industrial wastewater has attracted a significant amount of interest. However, excessive fouling complicates the treatment of anaerobic reactor effluent with membranes, which limits the application of membranes as a tertiary treatment. Here, we use an anaerobic sequencing batch reactor coupled to electrically conducting ultrafiltration and nanofiltration membranes to treat high-strength industrial wastewater containing high concentrations of benzyl alcohol, a commercial paint stripper. We demonstrate that an anaerobic process can be used successfully to degrade this contaminant. We also show that the application of negative electrical potential to the ultrafiltration membrane surface prevents membrane fouling and allows for higher operational fluxes during the treatment of complex wastewater streams. The application of positive potential to the membrane surface increases membrane fouling, as well as hindering the cleaning and recovery of the nanofiltration membranes. Overall, our experimental results demonstrate the feasibility of using electrically conducting membranes