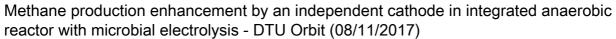
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Methane production enhancement by an independent cathode in integrated anaerobic reactor with microbial electrolysis Anaerobic digestion (AD) represents a potential way to achieve energy recovery from waste organics. In this study, a novel bioelectrochemically-assisted anaerobic reactor is assembled by two AD systems separated by anion exchange membrane, with the cathode placing in the inside cylinder (cathodic AD) and the anode on the outside cylinder (anodic AD). In cathodic AD, average methane production rate goes up to 0.070 mL CH4/mL reactor/day, which is 2.59 times higher than AD control reactor (0.027 m3 CH4/m3/d). And COD removal is increased ~15% over AD control. When changing to sludge fermentation liquid, methane production rate has been further increased to 0.247 mL CH4/mL reactor/day (increased by 51.53% comparing with AD control). Energy recovery efficiency presents profitable gains, and economic revenue from increased methane totally self-cover the cost of input electricity. The study indicates that cathodic AD could cost-effectively enhance methane production rate and degradation of glucose and fermentative liquid.

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