

## Abstract

Objective: To investigate a syntrophic interaction between *Geobacter sulfurreducens* and hydrogenotrophic methanogens in sludge-inoculated microbial fuel cell (MFC) systems running on glucose with an improved electron recovery at the anode. Results: The presence of archaea in MFC reduces Coulombic efficiency (CE) due to their electron scavenging capability but, here, we demonstrate that a syntrophic interaction can occur between *G. sulfurreducens* and hydrogenotrophic methanogens via interspecies H<sub>2</sub> transfer with improvement in CE and power density. The addition of the methanogenesis inhibitor, 2-bromoethanesulfonate (BES), resulted in the reduction in power density from 5.29 to 2 W/m<sup>3</sup>, and then gradually increased to the peak value of 5.5 W/m<sup>3</sup> when BES addition was stopped. Conclusion: Reduction of H<sub>2</sub> partial pressure by archaea is an efficient approach in improving power output in a glucose-fed MFC system using *Geobacter* sp. as an inoculum.

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