

Improvement of microbial electrosynthesis of CO<sub>2</sub> to acetate using different electron mediators  
in a bioelectrochemical system

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Microbial electrosynthesis(MESs) has been highlighted for the purpose of biological C1 gas reduction with simultaneous intermediates and value-added chemicals production. The bioelectrochemical system has been implemented to provide reducing power for biological C1 gas conversion by using external power supply. In MES, the interfacial electron transport between bacteria and electrode, is expected to regulate the whole conversion rate of electrosynthesis. It has been reported that the indirect electron transfer via electrochemically active redox molecule, facilitate acetate and VFA production in BES. However, the mechanism and performance of such mediators use, has not been extensively studied. In this study, we have compared different electron shuttles to improve the conversion rate of microbial electrosynthesis of CO<sub>2</sub>. The electrochemical characteristics of mediators in MES were examined with cyclic voltammetry and electrochemical analyses. Our results show that the appropriate selection of mediator can improve the efficiency of microbial electrosynthesis therefore develop a sustainable greenhouse gas reduction and reuse.