

Effects of different redox mediators on microbial electrosynthesis of CO₂

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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 or potentiostat. In MES, the interfacial electron transport between bacteria and electrode, is expected to regulate the whole conversion rate of electrosynthesis of CO₂. It has been reported that the indirect electron transfer via electrochemically active redox molecule, facilitate acetate and volatile fatty acid production in BES. However, the mechanism and performance of such mediators use, has not been extensively studied. In this study, we have compared different redox mediators for start-up of MES reactors. The electrochemical characteristics of mediators in MES were examined with cyclic voltammetry and electrochemical analyses and carbon balance. Our results show that the appropriate selection of mediator facilitates start-up and improves the intermediary metabolite productions in MES