Title:	High-capacitance bioanode circumvents bioelectrochemical reaction transition in the voltage-reversed serially-stacked air-cathode microbial fuel cell
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Keywords:	Serially-stacked microbial fuel cell system Voltage reversal Bioelectrochemical reaction transition Capacitive bioanode Carbon foam
Issue Date:	2020
Publisher:	Elsevier B.V.
Citation:	Journal of Power Sources, 468.
Abstract:	Serially stacked microbial fuel cells (serial-MFC), which are proposed for energy generation and bioelectronics applications, are always at the risk of voltage reversal. The voltage reversal not only leads to a great energy loss, but also results in the transition of bioelectrochemical reactions of bioanode thereby affecting the target function of the serial-MFC systems. In this study, we present a novel strategy of improving the power generation of serial-MFC system and preventing its collapse under the voltage reversal conditions. A high-capacitance carbon foam (CF) electrode is employed to circumvent the transitioning of bioelectrochemical reaction at the bioanode of serial-MFC systems. Compared to the serial-MFC with the routinely used low-capacitance graphite felt bioanode, the system with the high-capacitance CF bioanode could recover its performance under the voltage reversal conditions, such as, starvation condition for more than a week and over-high current density condition (or over critical current density) for more than a month. Based on the experimental observations, we also propose a possible mechanism behind the circumvention of bioelectrochemical reaction transition at the high-capacitance bioanodes.
Description:	Only IISERM authors are available in the record.
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