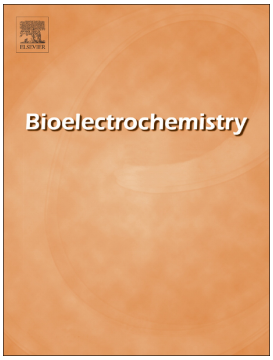

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Investigation of ceramic MFC stacks for urine energy extraction

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Abstract

Two ceramic stacks, terracotta (t-stack) and mullite (m-stack), were developed to produce energy when fed with neat undiluted urine. Each stack consisted of twelve identical microbial fuel cells (MFCs) which were arranged in cascades and tested under different electrical configurations. Despite voltage reversal, the m-stack produced a maximum power of 800 μW whereas the t-stack produced a maximum of 520 μW after 62.6 h of operation. Moreover, during the operation, both systems were subject to material blockage possibly due struvite. To the Authors' best knowledge, this is the first time that such a phenomenon in ceramic MFC membranes is shown to be the direct result of sub-optimal performance, which confirms the hypothesis that ceramic membranes can continue operating long-term, if the MFCs produce maximum power