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Mussel-inspired fabrication of a flexible free-standing membrane cathode for oxygen reduction in neutral media

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Abstract

In this paper, we present a flexible free-standing membrane cathode fabricated via the electroless metallization of bacterial cellulose (BC) by polydopamine (PDA) and silver nanoparticles. A BC/PDA composite membrane was synthesized by the self-assembly of PDA on the nanofibers of BC. The membrane was electrolessly metalized by reducing silver ions with the reducing groups present in PDA. The resulted membrane was flexible and had good mechanical property. The conductivity of the membrane was measured to be 2.72 ± 0.13 s/cm. SEM showed that PDA formed a uniform coating on the nanofibers