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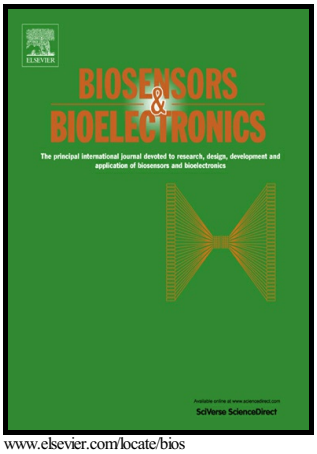

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Bipolar electrochemiluminescence on thread: a new class of electroanalytical sensors

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Abstract

This paper introduces a new and simple concept for fabricating low-cost, easy-to-use capillary microchannel (CMC) assisted thread-based microfluidic analytical devices (CMCA-μTADs) for bipolar electrochemiluminescence (BP-ECL) application. The thread with patterns of carbon screen-printed electrodes and bare thread zones (BTZs) is embedded into a CMC. Such CMCA-μTADs can produce a strong and stable BP-ECL signal, and have an extremely low cost ($0.01 per device). Interestingly, the CMCA-μTADs are ultraflexible, and can be bent with a 135^{o} bending angle at the BTZ or with a 150^{o} bending angle at the middle of bipolar electrode (BPE), with no loss of analytical performance. Additionally, the two commonly-used ECL systems of $Ru(bpy)_3^{2+}$/TPA and luminol/H_2O_2 are applied to

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