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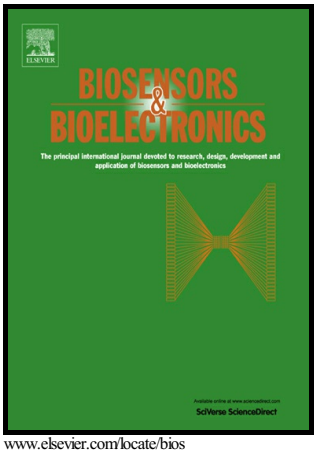

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Time-resolution addressable photoelectrochemical strategy based on hollow-channel paper analytical devices

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Abstract

The construction of a photoelectrochemical (PEC) strategy for multi-component detection represents a great challenge in the field of sensing. To address these challenges, herein we presented a hollow-channel paper-based PEC analytical platform based on chemiluminescence (CL) addressable strategies excited PEC strategy for multiplexed sensing application. Sandwich-structured CdS quantum dots (QDs)/reduced graphene oxide (RGO)/ZnO nanorods arrays (NRAs) heterostructure where CdS serves as visible light sensitizers, RGO acts as an electron relay between ZnO NRAs and CdS QDs, were simply assembled on the gold nanoparticles modified paper working photoelectrode (Au-PWE). The PEC performance of the CdS/RGO/ZnO can be greatly improved benefiting from the formation of type II band alignment between CdS QDs and ZnO NR as well as the super charge collection and shuttling property of RGO. Multiplexed CL emission could be achieved through controlling the CL co-reagents transport. By the virtue of CL addressable technique and the excellent PEC activity of