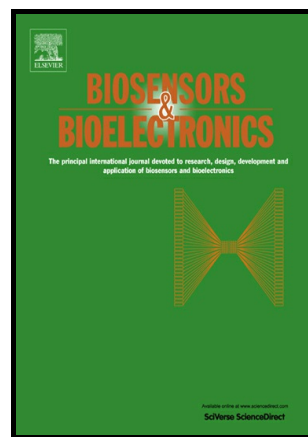


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Electrochemiluminescent resonance energy transfer of polymer dots for aptasensing

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Abstract: This work designed a three-component polymer for the preparation of polymer dots (Pdots). The polymer contained 9-(diphenylmethylene)-9H-fluorene (DPF), 9,9-dioctyl-9H-fluorene (DOF) and 1,1'-binaphthyl moieties, and was synthesized *via* Pd-catalyzed Suzuki reaction. It exhibited obvious yellow-colored aggregation-induced emission (AIE) for fluorescence enhancement at 543 nm *via* an intramolecular fluorescence resonance energy transfer from DOF moiety to DPF moiety. The Pdots prepared by nanoprecipitation could be conveniently cast on electrode surface and showed a stable anodic electrochemiluminescence (ECL) emission in the presence of triethylamine as a co-reactant. The ECL emission could be effectively quenched by rhodamine B *via* resonance energy transfer, which led to an “off-on” switch for the design of ECL sensing methodology. Using Pb²⁺ as a target model, an ECL aptasensor for the detection of trace Pb²⁺ was proposed, which showed a linear range of 100 pM to 1.0 μM with a detection limit down to 38.0 pM. This work demonstrated the first Pdots prepared with AIE-active polymer for highly efficient ECL sensing.

Keywords: Polymer dots; Aggregation-induced emission; Electrochemiluminescence; Aptasensor; Lead cation; Signal switch

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