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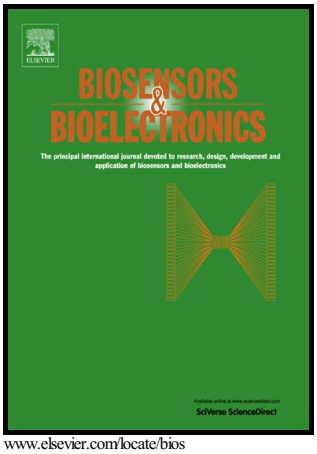

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Electrochemiluminescent resonance energy transfer of polymer dots for aptasensing

Feng Sun[a,†], Ziyu Wang [b,†], Yaqiang Feng[a], Yixiang Cheng[b], Huangxian Ju[a,*], Yiwu Quan[b,*]

[a]*State Key Laboratory of Analytical Chemistry for Life Science, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing 210023, P. R. China*

[b]*MOE Key Laboratory of Mesoscopic Chemistry, School of Chemistry and Chemical Engineering, Nanjing University, Nanjing 210023, P. R. China*

Abstract: This work designed a three-component polymer for the preparation of polymer dots (Pdots). The polymer contained 9-(diphenylmethylene)-9*H*-fluorene (DPF), 9,9-dioctyl-9*H*-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 Pb^{2+} as a target model, an ECL aptasensor for the detection of trace Pb^{2+} 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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* Corresponding author. Phone/Fax: +86-25-89683593.

E-mail address: hxju@nju.edu.cn, quanyiwu@nju.edu.cn

† These authors contributed equally to this work.