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Self-enhanced electrochemiluminescence immunosensor based on nanowires obtained by a green approach

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Abstract

Co-reactant electrochemiluminescence (ECL) is a simple and effective method for sensitive detection with amplified ECL signals. However, the intermolecular interaction between the luminescent reagents and their corresponding co-reactants, which is widely applied, has disadvantages in poor stability, low efficiency of electron transfer and relatively high loss of energy. In this work, an intramolecular self-enhanced ECL is proposed to settle this problem. Firstly, palladium nanowires (PdNWs) are synthesized with a green procedure in which Lentinan (LNT), one of β -glucans with a triple helical conformation (t-LNT) in aqueous solution and single chains (s-LNT) at a temperature higher than 130 °C, is used as stabilizer and reducing agent. The obtained PdNWs are applied to immobilize polyamidoamine (PAMAM) dendrimer which further reacts with tris (4, 4'-dicarboxylic acid-2, 2'-bipyridyl) ruthenium (II) dichloride to form a new electrochemiluminescent derivative (PdNWs-PAMAM-Ru). In this way, the Ru (II) luminophore and its co-reactive groups (amine groups in PAMAM) exist in the same

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