

Electrochemical Sensor Based on poly(3,4-ethylenedioxy - thiophene) Doped with Transition Metals for Detecting Rutin in Buck Wheat Tea

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doi: 10.20964/2018.02.66

Received: 15 June 2017 / Accepted: 18 August 2017 / Published: 28 December 2017

Herein, poly(3,4-ethylenedioxythiophene) (PEDOT) films doped with transition metals were electrochemically synthesized. Transition metal ions-EDTA (M-EDTA, M = Cu²⁺, Mn²⁺, Fe³⁺, Co²⁺, Ni²⁺) complexes served as dopants. Rutin as model molecular was utilized to investigate its electrochemical responses at PEDOT/M-EDTA modified electrodes. It was found the PEDOT/Co²⁺-EDTA exhibited better electrocatalytic activity toward rutin oxidation than other PEDOT/M-EDTA modified electrodes. Thus, PEDOT/Co²⁺-EDTA film-based electrochemical sensor was used to detect rutin. Low detection limit (1.67 nM), good reproducibility and wide linear range (5 nM-100 μM) were obtained. The sensor was employed for the determination of rutin in buckwheat tea. These results suggest that PEDOT/Co²⁺-EDTA could be utilized as a promising sensing platform for rutin detection.

Keywords: PEDOT; Transition metals; Rutin; Electrochemical detection; Sensor

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