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PEDOT: PSS-Modified platinum microelectrodes for measurements in aqueous media: Effect of polymer surface area on long-term anodic peak current stability (Article)

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Abstract

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Contamination of drinking water by hazardous agents is becoming a serious global threat, so it is necessary to develop more efficient sensing technologies for applications in liquid media. The limited working lifetime of electrochemical biosensors, especially when measurements are made continuously in liquid media, remains an unsolved challenge. We studied the effect of PEDOT:PSS surface area on platinum microelectrodes with respect to electrode ability to conduct reversible ion-to-electron transduction in liquid media. Electropolymerization of 3,4-ethylenedioxythiophene:poly(styrene sulfonate) EDOT:PSS to poly(3,4-ethylenedioxythiophene):poly(styrene sulfonate) (PEDOT:PSS) was conducted on microplatinum electrodes 5 and 10 mm long using a galvanostatic mode. Cyclic voltammetry was used to determine capacitive peak current; higher peak current indicates higher redox capacitance. Field-emisison scanning-electron microscopy was used to study the surface morphology of the PEDOT:PSS transucer layer after measurement in liquid media. The anodic capacitive peak currents did not differ significantly between the two electrodes at day one (–0.20 mA); however, peak current decreased by – 20% and – 80% at day six for 10- and 5 mm electrode lengths, respectively. The results imply that PEDOT:PSS surface area plays a role in transduction of PEDOT:PSS in aqueous media.

Author keywords

Anodic capacitive current | Electrochemical biosensor | Liquid media | Microplatinum electrode | PEDOT:PSS | Transducer

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References (10)

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1 Mello, L.D., Kubota, L.T.
Review of the use of biosensors as analytical tools in the food and drink industries

(2002) *Food Chemistry*, 77 (2), pp. 237-256. Cited 298 times.
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