

## Potentiometric urea biosensor based on a urease-immobilized polypyrrole

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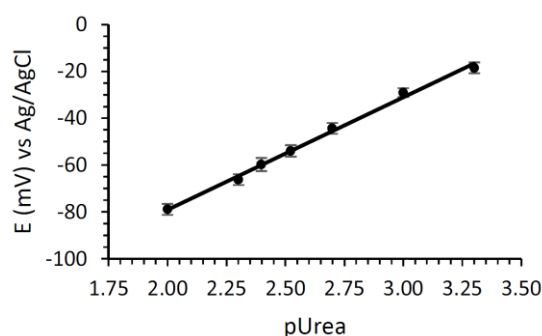
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Urea is one of the metabolic products of protein metabolism. The accurate determination of urea is important in glomerular filtration rate determination, renal function testing, and other biomedical applications. This research presents a simple fabrication of potentiometric urea biosensor based on a urease-immobilized polypyrrole (PPy). Thin film of PPy doped with hydroquinone monosulfonate (HQS) was potentiostatically electropolymerized on stainless steel supporting electrode. Urease was immobilized onto the PPyHQS film by mean of physical adsorption. FT-IR, UV-VIS, XPS and SEM were performed to confirm the existence of urease in PPyHQS film. The PPyHQS immobilized with urease activity of 200 U/mL showed the sensitivity of  $43.4 \pm 3.3$  mV/pUrea ( $r^2 > 0.98$ ). The linear response range of the urea biosensor was from 0.5 mM to 10 mM (pUrea 2–3.3). The urease-immobilized PPy offers a great potential in the use of conducting PPy as an effective transducer to convert physiochemical change into an electronic signal, enhancing in performance of the biosensor.



**Keywords:** Polypyrrole; Urea biosensor; Urease immobilization