



Research article

Novel all-solid contact Copper (II) - selective sensor based on Cefoperazone and poly(3,4-ethylenedioxythiophene) (PEDOT) as conducting polymer

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Abstract

A potentiometric all-solid contact copper (II) selective sensor based on Cefoperazone as a neutral carrier was developed. The electrode was prepared by coating the membrane solution containing PVC, plasticizer, and carrier on the surface of gold wire electrode. The coated gold Wire electrode (CGWE) exhibited a linear response of 31.01 ± 0.1 mV/decade over the range of 1.0×10^{-8} – 1.0×10^{-2} Cu (II) mol.L⁻¹, and lower detection limit (LDL) 4.0×10^{-9} mol.L⁻¹. The solid-contact Cu (II) solid electrode with conducting polymer poly (3,4-ethylenedioxythiophene) (PEDOT), as intermediate layer has been successfully used to detect ions at nanomolar level concentrations. The electrode has a response time between 5-10 s and was suitable for Cu (II) determination in aqueous solution over pH range (4.0–7.0). It was found to be selective towards Cu (II) ions over other common cations and the relevant potentiometric selectivity coefficients were calculated. The analytical utility of the proposed electrode was also demonstrated.