Cu(II) Ion-Selective Electrodes Based on Cu(II) Complex with Cyclized Salophen

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Several versions of Cu(II) ion selective electrodes (ISE), based on cyclized N,N′-bis(salicylidene)-o-phenylenediamine (salophen) complexes with Cu(II), were fabricated for determination of Cu(II) in aqueous solutions. The response of the ISE was optimized by variation of membrane composition and evaluation of various experimental conditions. Near Nernstian slopes (~ 28–32 mV/decade) were obtained for some preparations. The linear range of the ISE ranged from 5×10^{-5} to 1×10^{-2} M Cu(II). Coated-wire and coated disc ISE resulted practically in a similar response as screen printed electrodes (SPE). The potentiometric selectivity coefficients (K_{ij}) for all electrodes were determined for Na^+, NH_4^+, Ca^{2+}, Mg^{2+}, Ni^{2+}, Pb^{2+}, Zn^{2+}, Cd^{2+}, Co^{2+}, Fe^{3+}, Hg^{2+}, CO_3^{2-}, $H_2PO_4^-$, HPO_4^{2-}, SO_4^{2-}, CH_3COO^-, Br^-, I^-, NO_3^-, and SCN^-. The selectivity coefficients were in the range from 10^{-2} to 10^{-3} for all ions tested except Hg^{2+}, I^-, and to less extent Fe^{3+}. Fabricated ISE using the Cu(II)-salophen complex are reliable and stable.

Key words: Coated-Wire , Coated-Disc, Cyclized Salophen