Synthesis and Application of 2’-(5-Bromo-2-hydroxybenzylidene) Toluenesulfonohydrazide as a Shift Base Ionophore for Highly Selective Copper(II) Membrane Electrode

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doi: 10.20964/2017.03.28

Received: 9 September 2016 / Accepted: 10 January 2017 / Published: 12 February 2017

The construction of a potentiometric copper(II) ion electrode based on 2’-(5-bromo-2-hydroxybenzylidene) toluenesulfonohydrazide (5BrSALMeBSH) as an ionophore has been developed. The designed electrode having a different composition of poly(vinyl chloride) (PVC), plasticizers and ionophore showed that sensor with membrane composition 5BrSALMeBSH: PVC: DOP in the ratio of 7:40:56 (w/w) gave the best response. It exhibited a wide linear response with a Nernstian slope of 29.34 mV per decade over the concentration range of 1.0 x 10^-5 – 1.0 x 10^-1 M Cu(II) ions. Under the optimized conditions, the electrode has a detection limit of 3.98 x 10^-6 M and the working pH range of 3.0 – 6.0 with response time less than the 20s. The proposed electrode is stable for about two months and exhibits good selectivity for Cu(II) ions over Zn^{2+}, Co^{2+}, Ni^{2+}, Pb^{2+}, Mg^{2+}, Ba^{2+}, Ca^{2+}, Cd^{2+}, Ce^{3+}, K^+, Na^+. Designation of this easy and inexpensive electrode was used to determine a copper ion in wastewater samples, and the results obtained shown a sync relation with spectroscopy method which is AAS method conducted.

Keywords: Copper(II) selective electrode, 2’-(5-bromo-2-hydroxybenzylidene) toluenesulfonohydrazide, potentiometry, polymeric membrane electrode