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Poly(4-amino-3-hydroxynaphthalene-1-sulfonic acid) modified glassy carbon electrode for square wave voltammetric determination of amoxicillin in four tablet brands

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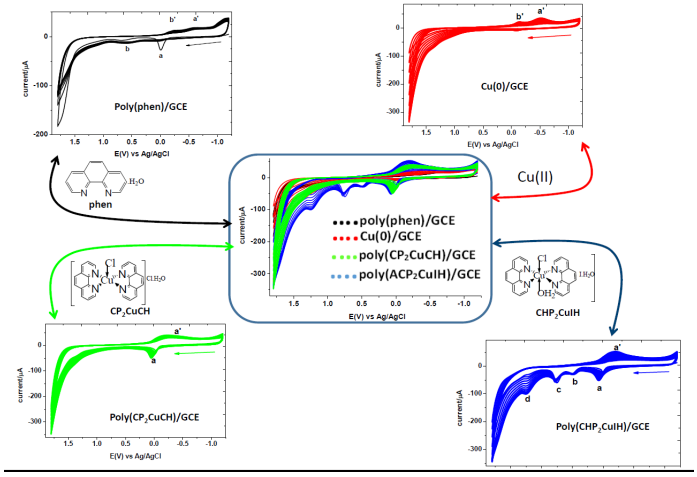
UV-Vis and FT-IR results confirmed synthesis of a novel complex, aquachlorobis(1,10-phenanthroline) copper(II) iodidemonohydrate (ACP_2CuIH), following a simple ion exchange reaction. CV and EIS results of potentiodynamically fabricated novel poly(ACP_2CuIH)/GCE revealed modification of the electrode surface by a conductive, and electroactive polymer film leading to an increased effective electrode surface area. In contrast to the unmodified electrode, appearance of an irreversible oxidative peak at much reduced potential with five folds current enhancement at poly(ACP_2CuIH)/GCE showed catalytic effect of the modifier towards oxidation of amoxicillin (AMX). DPV current response of poly (ACP_2CuIH)/GCE showed linear dependence on concentration of AMX in the range 5×10^{-7} - 1.0×10^{-4} M with LOD and LOQ of 1.3×10^{-8}, and 4.6×10^{-8} M, respectively. The AMX level in selected four tablet brands were in the range 95.2–101.8% of their nominal values. Spike recovery results of 98.8-100.6%, interference recovery results with less than 4.5%error, lower LOD and wider dynamic range than most of the previously reported methods validated the potential applicability of the present method based on the novel poly (ACP_2CuIH)/GCE for determination of AMX in real samples with complex matrix.



Recent Publications

1. Amare M*, Worku A, Kassa A, Hilluf W (2020) Green synthesized silver nanoparticle modified carbon paste electrode for SWAS voltammetric simultaneous determination of Cd(II) and Pb(II) in Bahir Dar Textile discharged effluent. Heliyon 6(7): e04401.

2. Amare M, Admassie, S (2020) Potentiodynamic fabrication and characterization of poly(4-amino-3-hydroxynaphthalene sulfonic acid) modified glassy carbon electrode. Journal of Materials Research and Technology. 9(5): 11484-11496.

3. Bitew Z, Amare M (2020) Recent reports on electrochemical determination of selected antibiotics in pharmaceutical formulations: A mini review. Electrochemistry Communications 121: 106863.

4. Kindie M, Andargie M, Hiluf W, Amare M (2020) Assessment on level of selected heavy metals in Nile Tilapia and Barbus fish species and water samples from the Southern parts of Lake Tana, Ethiopia. Scientific African 9: e00519.

5. Dawit M, Turbale M, Moges A, Amare M (2021) Poly(alizarin Red) modified glassy carbon electrode for square wave adsorptive striping voltammetric determination of metronidazole in tablet formulation. Plos One 15(12): e0244115.