Selective Preconcentration of Ultra Trace Copper (II) ion Using Square Wave Cathodic Adsorptive Stripping Voltammetry at Modified Carbon Past Electrode

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Ultra-trace copper determination in natural water and human hair samples was performed using stripping voltammetric based on Square wave cathodic adsorptive. The mechanism of Square wave cathodic Adsorptive Stripping was applied to increase the sensitivity of the proposed method. Copper (II) was preconcentrated on the surface of the carbon past electrode modified by pa(E)-2-(Mercapto-phenylamino-methylene)-3-oxo-N-p-tolyl-butanamide (MPMPB) through a surface coordination effect. To optimize the analysis of copper(II) ion, different parameters such as pH, accumulation potential and time, medium, scan rate, and ionic strength were investigated. By applying the optimal conditions, the adsorbed form is reduced irreversible viz; 0.1M Britton-Robinson at (pH ~ 6.00) with linear concentration ranges of 0.013 – 0.064 at 15, 30 and 0.012–0.076 ng/mL at 60 s. The common electroactive and metal ions interferences were tested. To increase the selectivity of the proposed method, common interferences of electroactive and metal ions were studied. This method is sensitive selective, and efficient, therefore it can determine the low levels of copper(II) in water and human hair samples successfully.

Keywords: square wave adsorptive stripping voltammetry, ultra trace determination of copper, carbon paste electrode modified by (MPMPB), surface water, human hair samples.

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