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Development of an Electrochemical Sensor for the Detection of Copper (II) and Mercury (II) ions in solution

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Abstract : An electrochemical sensor was designed using carbon paste and acidified and calcinated clay to detect traces of Cu (II) and Hg (II) metal ions in solution. After 5 minutes of accumulation in open circuit, the sensitivity of the electrode was evaluated in a solution of Na₂SO₄ (0.1M) by square wave voltammetry on the one hand with Cu (II) and on the other with the Hg (II). Several parameters such as the effect of accumulation time, the effect of the scanning rate, the effect of concentration, the effect of pH, the effect of ionic interference on the electrochemical response of the electrode work were studied. Under optimal conditions and after 5 minutes of accumulation the detection limits were 4.7µg.L⁻¹ and 288.6µg.L⁻¹ respectively for Cu (II) and Hg (II) in the electrolytic solution. In tap water, on the other hand, the detection limit was 48.2 µg.L⁻¹ for copper and undetermined for mercury. This electrode was ultimately used for the simultaneous electroanalysis of Cu (II) and Hg (II).

Key-words : *Sensor; Graphite carbon; Calcinated Clay; Square wave Voltammetry; Electrochemical response.*

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