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# Differential pulse anodic stripping voltammetry for detection of As (III) by Chitosan-$Fe(OH)_3$ modified glassy carbon electrode: A new approach towards speciation of arsenic

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**Abstract**

An efficient electrochemical sensor for As(III) was developed based on adsorption of arsenic on a specially modified electrodes at some applied potential and subsequent i) stripping at a fixed potential by anodic stripping voltammetry ii) analysis by generating surface plasmon resonance (SPR). The working glassy carbon electrode was modified by Chitosan-$Fe(OH)_3$ composite and a reducing agent L-Cysteine. The composite enhanced adsorption of As(III) and subsequent reduction to As(O) moieties and measurement by anodic stripping. The surface property of modified electrode was characterized by SEM, AFM, FTIR, XPS and electrochemistry was analyzed by impedance spectroscopy (EIS). Surface Plasmon resonance (SPR) was also employed to investigate the As(III) binding capability of polymer matrix. Several optimum voltammetric parameters e:g supporting electrolyte; 0.1M acetate buffer (pH 5.2) deposition potential, -0.9 V; deposition time, 100 s were established for anodic stripping voltammetry (ASV). A linear correlation was obtained in the range of 2-100 ppb for ASV ($R^2$ 0.974) with limit of detection 0.072 ppb. A variety of common coexistent ions such as Mn, Zn, Pb, Cu, Cd in