**Bioaccumulation and determination of lead using treated-Pennisetum-modified carbon paste electrode**

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**Source:** TALANTA **Volume:** 61 **Issue:** 4 **Pages:** 455-464 **DOI:** 10.1016/S0039-9140(03)00316-3 **Published:** NOV 12 2003

**Abstract:** The present work describes the development and application of a carbon paste electrode modified by treated-Pennisetum setosum for the determination of lead(II) by anodic stripping differential pulse voltammetry. Most experiments were performed using the preconcentration/voltammetry/regeneration scheme. The resulting modified electrode offers a preferential uptake of lead(II) from solutions. Operational conditions, such as percentage treated-Pennisetum loading in the carbon paste, pH of electrolyte solution, ionic strength, preconcentration time, voltammetric waveform and interference are characterized and optimized to allow quantitative determination of lead. The electrode surface can be regenerated by immersing the modified electrode in 0.05 mol l(-1) hydrochloric acid for 2 min. For the measurement step, the optimum conditions were acetate buffer pH 5.0 and 0.60 ionic strength with the preconcentration time of 5 min. The modified electrode contained 10% (w/w) treated-Pennisetum. The detection limit (3sigma) was 0.01 mg l(-1) Pb(II). For 16 preconcentration/measurement/renewal cycles, the responses could be reproduced with a 5.39% relative standard deviation. This method has been be successfully applied to the determination of lead(II) in natural water samples using standard addition method. 

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