

Full Paper

Application of Calcon as Complexing Agent for the Simultaneous Determination of Lead and Cadmium in Sea Water with Adsorptive Cathodic Stripping Voltammetry

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Abstract- In the present study, a selective method is presented for the simultaneous determination of lead and cadmium in sea water samples by adsorptive cathodic stripping voltammetry (AdCSV). In preliminary studies, it has been proven that the lead and cadmium react with Calcon, giving rise to the formation of these complexes. These complexes have adsorptive characteristics on hanging mercury drop electrode (HMDE) and can be reduced in a reduction step. In this study the optimum reaction parameters and conditions studies are investigated. The optimum conditions of the AdCSV-calcon method are KCl concentration 1 mol/L pH 5, calcon concentration 0.1 mmol/L, accumulation potential -0.2 V, accumulation time 60 s. RSD for lead and cadmium are (4.2 and 0.36)%, performed 10 replicates (n=10), recovery for lead and cadmium (99.87, and 99.39)%. The calibration graphs were linear in the concentration range of (10–160, and 10–190) ng/ml for lead and cadmium, respectively. The limit of detection of the method was 10 ng/mL for lead and cadmium are (0.02, and 0.05) ng/mL. The interference of some common ions was studied and it was concluded that application of this method for the determination of lead and cadmium in sea water samples led to satisfactory results.

Keywords- A selective method, (Pb and Cd), Sea water, Calcon, Adsorptive cathodic stripping voltammetry
