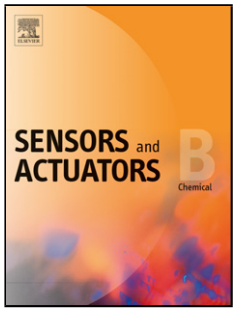

Title: High sensitivity adsorptive stripping voltammetric method for antimony(III) determination in the presence of quercetin–5′–sulfonic acid. Substituent effect on sensitivity

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High sensitivity adsorptive stripping voltammetric method for antimony(III) determination in the presence of quercetin–5'–sulfonic acid. Substituent effect on sensitivity

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ABSTRACT

A high sensitivity method for voltammetric determination of Sb(III) using quercetin−5'−sulfonic acid (QSA) as complexing and adsorbing agent is presented. The Sb−QSA is accumulated on the electrode surface and then reduced at about −0.67 V. Optimal analytical conditions were pH: 5.5, C_{QSA}: 3.0 µmol L^{-1}, E_{ads}: –0.10 V and t_{ads}: 60 s. The detection limit (3σ) depends on accumulation time, reaching 3.6 and 1.6 ng L^{-1} with t_{ads} of 60 and 180 s, respectively. Peak current is proportional to Sb(III) concentration up to 10.0 µg L^{-1} and 1.5 µg L^{-1} with t_{ads} of 60 and 180 s, respectively. The relative standard deviation were 1.7 and 2.5% for a solution containing 1.0 and 5.0 µg L^{-1} of Sb(III) respectively (n = 10). Interference by other metal ions was studied. The proposed method was applied to the determination of antimony in natural and spiked water samples, with satisfactory results. The method was designed in order to compare the sensitivity of the methods that use quercetin and the sulfonic derivative.

Keywords: Antimony, Quercetin–5'–sulfonic acid, Adsorptive Stripping Voltammetry

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