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Simultaneous voltammetric determination of vanillin and caffeine in food products using an anodically pretreated boron-doped diamond electrode: Its comparison with HPLC-DAD

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Abstract

This paper describes an electroanalytical method for the simultaneous determination of vanillin (VAN) and caffeine (CAF) using an anodically pretreated boron-doped diamond electrode. Selective determination of one compound in the presence of other one was also realized. Both compounds yielded a single irreversible oxidation peak using cyclic voltammetry. The nature of the electrode reaction was found to be diffusion controlled with contribution of adsorption. By using square-wave adsorptive stripping voltammetry after 60 s accumulation under open-circuit voltage, method allowed simultaneous determination of VAN and CAF in phosphate buffer, pH 2.5, with detection limits of $0.234 \mu\text{g mL}^{-1}$ (1.54×10^{-6} M) and $0.071 \mu\text{g mL}^{-1}$ (3.66×10^{-7} M), respectively. The proposed method was successfully applied in the selective and simultaneous determination of VAN and CAF in commercial food

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