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Assay of nitrofuran drugs using an amperometric monoamine oxidase biosensor

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Abstract

A method for assaying nitrofuran drugs (furazolidone, furadonine, and furagin) using an amperometric biosensor based on a printed platinum electrode and immobilized monoamine oxidase was developed for analysis of medicinal formulations and urine. Nitrofuran derivatives were found to have inhibitory actions, albeit weaker than those of classical tricyclic antidepressants, on the catalytic activity of monoamine oxidase. This side-effect inhibitory action allowed assay of furazolidone, furadonine, and furagin with lower detection limits, which were 8.3 × 10-9, 8.5 × 10-8, and 9.4 × 10-10 M respectively. The results obtained here show that this side effect of furazolidone, furadonine, and furagin must be taken into consideration when these agents are prescribed to patients.

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Keywords

Amperometric biosensor, monoamine oxidase (MAO), nitrofuran derivatives, printed electrodes