Journal of Analytical Chemistry 1999 vol.54 N3, pages 283-289

Enzymatic determination of α-aminophosphonates with butyryl cholinesterase and carboxylesterase

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Abstract

The analytical characteristics of the determination of α-aminophosphonates were studied using butyryl cholinesterase from horse serum and microbial carboxylesterase stabilized by incorporation in water-soluble N-phthalylchitosan-based polymeric films. It was demonstrated that the compounds under study exhibited only a slight reversible inhibiting effect; however, their oxidation with electrochemically generated chlorine resulted in an irreversible inhibiting effect, which became more pronounced in an acidic medium. With the use of carboxylesterase, whose activity hardly depended on the pH of the medium and the action of ionic effectors, allowed the limits of detection (LOD) for α-aminophosphonates to be lowered by a factor of 1.5-10 (down to 10-8 M) compared to those obtained with cholinesterase.