Conductometric Method for Rapid Lipase Activity Quantification

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A new approach for lipase activity quantification was proposed and applied in a simple, rapid and cost effective conductometric method based on conductance change registration along the time during the enzymatic degradation of a thin nanocomposite substrate layer (SiO₂ nanoparticles loaded olive oil) deposited onto conductometric electrodes. The sensitive layer thickness diminution along the time causes its conductance augmentation proportional to the lipase activity. The proposed method was characterized in terms of lipase activity linear quantification range and LOD, quantification time, precision and reproducibility at optimized pH 8. The relative error was found to be from 3.6% to 1.2% at the linear quantification range from 1.1×10^{-2} to 1.17 U mL^{-1} respectively with a LOD of $0.8 \times 10^{-3} \text{ U mL}^{-1}$. Finally, the method was validated with spiked samples applying spectrophotometric method as reference.

Keywords: Conductometry, Lipase activity quantification, nanocomposite

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