

5' -核苷酸酶和HRP酶共固定修饰电极快速检测鸡肉中肌苷酸含量

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摘要:

利用气相沉积方法在玻碳电极表面得到二氧化钛凝胶膜,并在电极表面同时固定5' -核苷酸酶(5' -NT)和辣根过氧化物酶(HRP),构建了一种新型快速测肌苷酸(IMP)含量的安培传感电极(5' -NT-HRP/GCE)。在溶解氧存在的条件下,IMP被凝胶膜中的5' -NT催化氧化,通过产物H₂O₂在电位-150mV下被HRP酶催化还原的电化学响应对IMP进行测定。在邻苯二酚存在下,该传感器对IMP表现出快速的响应(响应时间小于10秒)。该电极对IMP的测定具有较宽的线性范围(1.0×10^{-6} - 2.0×10^{-4} mol/L)和较低的检测限(0.5×10^{-6} mol/L)。该电极对IMP的测定具有很高的准确度和良好的重现性。除抗坏血酸以外,与IMP共存的其它物质对其没有干扰。结果表明,该电极显示出很好的重现性和稳定性,能用于鸡肉中IMP的在线检测。

关键词: 酶修饰电极, 5' -核苷酸酶, 辣根过氧化物酶, 肌苷酸

Fast Determination of Inosine monophosphate in Chicken Samples by 5'-nucleotidase / HRP Coimmobilized Modified Electrode

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Abstract:

A titania sol-gel film was formed by vapor deposition method to coimmobilize 5' - nucleotidase (5' -NT) and horseradish peroxidase (HRP) on a glassy carbon electrode surface for the construction of an amperometric inosine monophosphate (IMP) biosensor (5' -NT-HRP/GCE). IMP could be oxidized by dissolving oxygen in presence of immobilized 5' -NT to form H₂O₂ which was determined at -150mV through HRP on the biosensor. In the presence of catechol as a mediator, the sensor exhibited a rapid electrocatalytic response (less than 10 seconds). The linear range for phenol determination was from 1.0×10^{-5} to 2.0×10^{-4} mol/L with a detect limit of 0.5×10^{-6} mol/L. The biosensor shows a high degree of accuracy and good reproducibility, and the general interferences coexisted in chicken samples. The results show a good reproducibility stability and indicate the sensor can be used in on-line determination of IMP in real chicken samples.

Keywords: Enzyme modified electrode; 5' - nucleotidase; horseradish peroxidase; inosine monophosphate