Simultaneous Quantitation of Caffeic Acid and Ferulic Acid Based on Graphite-like $\text{C}_3\text{N}_4$/chitosan Modified Film

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Caffeic acid (CA) and ferulic acid (FA), as the simple phenolic acids, widely exist in plants and food. In this experiment, a novel method based on graphite-like carbon nitride ($\text{g-}\text{C}_3\text{N}_4$) and chitosan (CS) was applied to determinate CA and FA in food samples. X-Ray diffraction (XRD), fourier transform infrared spectrometer (FTIR), ultraviolet visible spectrophotometer (UV-\textit{vis}) and transmission electron microscope (TEM) were illustrated that $\text{g-}\text{C}_3\text{N}_4$ was synthesized successfully and had a unique two-dimensional structure. Under the optimized conditions, including the scan rate, pH and so on, the modified electrode had a sensitive response to CA and FA in the range of 1-30 $\mu\text{g/mL}$ and 5-30 $\mu\text{g/mL}$ with the detection limits of 0.354 $\mu\text{g/mL}$ and 4.964 $\mu\text{g/mL}$ (S/N=3), respectively. The electrochemical method showed satisfactory results and provided a new approach to determinate phenolic acids with many advantages, such as rapid response, easy operation, low cost and highly sensitive.

Keywords: Graphite-like carbon nitride; Caffeic acid; Ferulic acid; Electrochemical determination

FULL TEXT

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