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A Novel Flow Injection Method with Chemiluminescence Detection for the Determination of Carmoisine in Gelatin Desserts

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Abstract

Carmoisine dye, a red azo food colorant commonly utilized to impart a red color to synthetic food products, is the subject of this study. Here, we present a novel reversed flow injection analysis with a chemiluminescence detection (FIA-CL) method employing a newly developed homemade flow cell to determine carmoisine dye. This developed method is based on the inhibition effect of the dye on the chemiluminescence light (CL) emission generated from a luminal-hypochlorite system, whereby the reduction in CL intensity correlates directly with the concentration of carmoisine dye. Investigations into various analytical parameters were conducted to enhance method efficiency and applicability. A linear calibration graph of 4.0 to 100.0 $\mu\text{g mL}^{-1}$ was established ($R^2 = 0.9993$), with a detection limit of $\text{LOD} = 2.93 \mu\text{g mL}^{-1}$. Subsequent application of the proposed method to analyze gelatine dessert samples yielded results in reasonable agreement with those obtained using the reported HPLC method, as evidenced by student t-test and F-test analyses.

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