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The Resolution of Ternary Mixtures of Dyes by Partial Least-Squares Multivariate Spectrophotometric Calibration and Derivative Spectrophotometry

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Simple and fast spectrophotometric methods for the determination of the components of ternary mixtures of dyes have been proposed. For the simultaneous determination of Sunset Yellow (E110), Tartrazine (E102), and Ponceau 4R (E124) in granulated drinks partial least square (PLS) method was applied to the spectrophotometric data in the range 400–600 nm, at 10 nm intervals. In the procedure 27 standard mixtures of three assayed compounds at three concentration levels were used. Absorbance measurements were performed in methanolic solutions. The results were compared with those obtained using a common derivative spectrophotometric procedure (zero-crossing technique). These procedures did not require any separation steps. Statistical evaluation of the method bias was performed. It was concluded that PLS method might be competitive with derivative procedure for the separation of ternary mixtures of dyes.