

Optimization and Validation of an HPLC-UV Method for Determination of Benzoic Acid and Sorbic Acid in Yogurt and Dried-Yogurt Products Using a Design of Experiment

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A method for the determination and analysis of benzoic acid and sorbic acid in yogurt and dried-yogurt products has been developed. This method was based on the use of a simple solid-liquid extraction method, followed by the high-performance liquid chromatography with a UV detector (HPLC–UV), enhanced with the aid of response surface methodology and design of experiment (DOE). The method excludes the use of complicated procedures, time-consuming and labor-intensive pre-treatment processes. Separation of the benzoic acid and sorbic acid with higher selectivity and sensitivity, and within reasonable retention time was performed by using an isocratic mobile phase of acetate buffer (pH 5.6)-methanol 60: 40 at a column temperature of 25 C. Optimization of sample preparation and analytical conditions gave recoveries in the range of 81 to 111% at spike levels of 2–20 mg/L and the relative standard deviations (RSDs) was lower than 9% in all cases. The intra-day precision and inter-day precision results were in the range of 8.4–8.5% and 10.4–11.0%. Additionally, the limits of detection (LOD) were 0.66 and 0.51 mg/L and the limits of quantification (LOQ) were 1.3 and 1.0 mg/L for benzoic acid and sorbic acid, respectively.

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