

عنوان مقاله:

Development of a validated gas chromatography-mass spectrometry method for simultaneous analysis of 24 Polycyclic Aromatic Hydrocarbons (PAH) in Lavash bread

محل انتشار:

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خلاصه مقاله:

Polycyclic aromatic hydrocarbons (PAHs) are a group of chemicals that not only occur naturally in coal and crude oil but also are made in some burned foods. PAHs are very toxic and chronic exposure to low levels of some PAHs has associated with cancer. Annually, 15 million tons of various breads such as Lavash, sangak and Taftoon are produced in Iran. Therefore, production of healthy bread is very important. In this study, a validated method was developed for simultaneous determination of 24 main polycyclic aromatic hydrocarbons (PAHs) in Lavash bread by gas chromatography-mass spectrometry (GC-MS). A gas chromatographic system from Agilent technologies (Model 7890 A) with a single quadruple mass Spectrometry detector (Model 5975 C) equipped with split/splitless injector and an Agilent auto-sampler with a HP-5 19091S-436 Agilent capillary column (60 m × 0.25 mm I.D., 0.25 μm film thicknesses) was used. QuEChERS extraction method was applied for sample preparation. For overcoming matrix effects spiked-based calibration curves were used and the results showed a linear relationship between the concentrations and peak areas of the chemicals in the range of 10-500 ng/g with a determination coefficient (R^2) ranging between 0.994 and 0.999. The average recoveries at 3 concentration levels were in the range of 87.0-111.0% for each PAH compound. The relative standard deviations (RSDs) of PAHs were in the range of 2.8-11.5% with a satisfactory precision ($RSD < 20\%$). The limit of detection and limit of quantification were 0.139 -1.489 ng/g and 0.459 -4.915 ng/g, respectively. Matrix effect for most of the analytes presents a strong signal enhance ($> 50\%$). The method was successfully applied for determination of 24 PAHs in 21 Lavash bread samples collected from Tehran. The results showed that three samples in a range of 0.499–2.409 ng/g were contaminated with phenanthrene. Therefore, a comprehensive survey for monitoring of PAHs in traditional bread samples seems to be needed.

کلمات کلیدی:

GC-MS, Poly Aromatic Hydrocarbons (PAHs), Lavash

لینک ثابت مقاله در پایگاه سیویلیکا:

