

Determination of Furan and Alkylfurans by Purge-and-Trap GC-MS .

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Abstract

Furan and alkylfurans (such as 2-methylfuran, 3-methylfuran and 2,5-dimethylfuran...) are process contaminants that are formed in foods during thermal processing possibly carcinogenic to humans.

Furan and alkylfurans have been reported to occur in coffee, baby food, fruit juices, crackers... In particular, coffee contained the largest amount of furan.

This study presents a method for the determination of furan and alkylfurans in ground coffee using purge-and-trap (P&T) coupled with gas chromatography-mass spectrometry (GC-MS).

The P&T method was optimized by evaluating various parameters, and its accuracy and precision were assessed by analyzing spiked coffee samples. The method was applied to commercial coffee samples, and the calibration curves for furan and four alkylfurans were obtained. The developed method can contribute to the improvement of food safety and quality control measures in the coffee industry.

Furan and alkylfurans are organic compounds that have been found to have potential carcinogenic and toxic effects on human health (Gibbs et al., 2014; Wang et al., 2018; Zhu et al., 2019). These compounds are formed during various food processing and cooking procedures, such as high-temperature heating and roasting, and can be found in a wide range of food products, including coffee (Becalski et al., 2011; Chatzimitakos et al., 2017). The presence of these compounds in coffee is of particular interest due to coffee being one of the most widely consumed beverages in the world.

The determination of furan and alkylfurans in coffee is challenging due to the complexity of the matrix and the low concentrations of these compounds. The roasting process can also result in the formation of other volatile organic compounds (VOCs), which can interfere with the analysis of furan and alkylfurans.

Keywords: Furan and alkylfurans 、 purge-and-trap