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Direct determination of acrylamide in potato chips by using  
headspace solid-phase microextraction coupled with gas  
chromatography-flame ionization detection

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Abstract

Acrylamide is a potentially toxic and carcinogenic substance present in many high-consumption foods. Recently, this matter has been placed in category of “reasonably anticipated to be a human carcinogen” by National Toxicology Program (NTP). Therefore, simple and cost-effective determination of acrylamide in food samples has attracted intense interest. The most reported techniques for this purpose are GC-MS and LC-MS, which are very expensive and available in few laboratories. In this research, for the first time, a rapid, easy and low-cost method is introduced for sensitive and precise determination of acrylamide in foodstuffs, using gas chromatography-flame ionization detection (GC-FID) system after its direct trapping in the upper atmosphere of samples by headspace solid-phase microextraction (HS-SPME). The effects of main experimental variables were studied and the optimized parameters were obtained as the type of fiber, carboxen/divinylbenzene/polydimethylsiloxane (CAR/DVB/PDMS); extraction time, 30 min; extraction temperature, 60 °C; moisture content, 10 µL water per 1 g of sample; desorption time, 2 min; and desorption temperature, 230 °C. The linear calibration graph was obtained in the range of 0.77-50 µg g<sup>-1</sup>, with regression coefficient of 0.998. The detection and quantification limits of the proposed

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