

研究论文

气相色谱-质谱法检测食品中的丙烯酰胺

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摘要 建立了一种用于食品中丙烯酰胺含量的气相色谱-质谱联用检测方法。通过水和甲醇提取食品中的丙烯酰胺, 经蛋白变性净化后用溴水对其进行加成衍生化, 再采用有机溶剂进行液液萃取, 之后同三乙胺发生定量反应转化为性质更稳定的产物后由气相色谱-质谱联用仪检测, 同位素内标法定量。该方法在0.02, 0.05和0.2 mg/kg等3个添加水平下面粉和面包中丙烯酰胺的回收率处于80%和110%之间, 相对标准偏差(RSD)不大于12.7%;在0.04~4.00 mg/L内呈现良好的线性关系;灵敏度高, 最低检测限达到5 μg/kg;选择性好, 能有效消除复杂基质带来的干扰。可作为常见样品中丙烯酰胺含量检测的确证方法。

关键词 [气相色谱-质谱联用](#); [丙烯酰胺](#) [炸薯条](#) [面包](#)

分类号

Determination of Acrylamide in Foods by Gas Chromatography-Mass Spectrometry

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Abstract

A confirmatory method is presented for the determination of acrylamide in different food products by gas chromatography-mass spectrometry (GC-MS). The method is based on the extraction of acrylamide with water and methanol, and purification with Carrez I (zinc sulfate) and Carrez II (potassium hexacyanoferrate) solution, followed by bromination onto the acrylamide double bond. The derivative was extracted with ethyl acetate/hexane (4: 1, v/v), and converted to the stable 2-bromopropenamide by dehydrobromination using 10% triethylamine, then analyzed by GC-MS, employing ¹³C₃-acrylamide as internal standard. In-house validation data for flour and bread showed good accuracy and precision of the method. The recoveries of acrylamide in the French fries and bread were all in the range from 80% to 110% after correction of analyte loss by the internal standard at three spike levels of 0.02, 0.05 and 0.2 mg/kg, and relative standard deviations (RSDs) no more than 12.7%. The limits of detection for flour and bread were estimated at 5 μg/kg.

Key words [gas chromatography-mass spectrometry \(GC-MS\)](#) [acrylamide](#) [French fries](#) [bread](#)

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