

反吹-气相色谱法检测蔬菜中的有机磷农药残留

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Determination of organophosphorus pesticide residues in veg chromatography using back-flush technique

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摘要

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摘要 采用反吹技术改进了气相色谱检测大批量蔬菜样品中有机磷农药残留的方法。在样品中加入乙腈、氯化钠混合溶液振荡,离心分提取液。取部分提取液浓缩、定容,用配备火焰光度检测器及微流控装置的气相色谱仪进行有机磷农药检测。16种有机磷农药在0.040~3.20 mg/L内具有良好的线性关系($r > 0.9996$)。回收率为75.2%~111.5%,相对标准偏差为2.8%~10.4%,检出限为0.003~0.01 mg/kg。通过反吹可以有效降低基质效应影响,缩短每个样品的运行时间,减少停机维护和材料消耗,节约38%的检测时间。

关键词: 气相色谱 反吹 基质效应 农药残留

Abstract: The back-flush technique was used in the determination of organophosphorus pesticide residues in vegetables by gas chromatography. The pesticide residues were extracted with acetonitrile and sodium chloride solution by mechanical shaking, and separated by centrifuging and partitioning. The extract was analyzed by gas chromatography equipped with a flame photometric detector and a micro fluidic device with back-flush function. The results showed that the 16 organophosphorus pesticides have good linearity within the concentration range of 0.040~3.20 mg/L. Recoveries varied from 75.2% to 111.5%, with the relative standard deviations (RSDs) in the range of 2.8%~10.4%. The detection limits of these target compounds were from 0.003 to 0.01 mg/kg. The application of back-flush technique in this method significantly reduced the cycle time and matrix effect and improved the analysis efficiency.

Keywords: gas chromatography (GC) back-flush matrix effect pesticide residues

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