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气相色谱法测定茶叶及土壤中的高效氯氟氰菊酯残留量

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Determination of lambda-cyhalothrin residue in tea and soil using gas chromatography

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摘 要 建立了气相色谱测定茶叶及土壤中高效氯氟氰菊酯残留量的分析方法。茶叶和土壤样品用正己烷提取,毛细管柱分离,气相色谱-电子捕获检测器(GC-ECD)检测。结果表明: 在高效氯氟氰菊酯添加量为0.02～2.00 mg/kg范围内,高效氯氟氰菊酯在鲜茶叶和土壤中的平均添加回收率分别为89.0%～94.1%和89.8%～94.7%,相对标准偏差(RSD, n=5)分别为3.0%～4.9%和2.5%～4.2%,方法的最低检出限(S/N=3)为0.002 mg/kg。采用该方法测定2.5%高效氯氟氰菊酯微乳剂在湖南长沙茶叶及土壤中的消解动态,其符合一级动力学消解模式,消解方程分别为y=3.1996e-0.3394x和y=0.1224e-0.1036x,相关系数分别为0.9956和0.9247。在茶叶中的半衰期为2.04 d,在土壤中的半衰期为6.69 d。该方法为湖南长沙地区茶叶种植科学合理地使用杀虫剂高效氯氟氰菊酯提供了依据。

关键词： 气相色谱法 高效氯氟氰菊酯 残留 茶叶 土壤

Abstract： A gas chromatographic (GC) method was established for the determination of lambda-cyhalothrin residue in tea and soil. Tea and soil samples were extracted with hexane, separated by capillary column and determined by gas chromatography-electron capture detector (GC-ECD). The average recoveries of lambda-cyhalothrin in tea and soil were 89.0%-94.1% and 89.8%-94.7% , respectively at the spiking levels of 0.02 to 2.00 mg/kg. The corresponding relative standard deviations (RSDs, n=5) were 3.0%-4.9% and 2.5%-4.2%, respectively. The limit of detection (S/N=3) was 0.002 mg/kg for lambda-cyhalothrin. The degradations of 2.5% lambda-cyhalothrin microemulsion in tea and soil in Changsha, Hunan were investigated and the degradation equations were y=3.1996e-0.3394x and y=0.1224e-0.1036x with the correlation coefficients of 0.9956 and 0.9247, respectively. The half-lives of lambda-cyhalothrin in tea and soil were 2.04 days and 6.69 days, respectively.

Keywords： gas chromatography (GC) lambda-cyhalothrin residue tea soil

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