

研究论文

应用搅拌棒吸附萃取-热脱附-气相色谱-质谱分析烟用香料的化学成分

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摘要 应用搅拌棒吸附萃取法(SBSE)提取烟用香料的化学成分, 并利用热脱附(TD)和色谱-质谱联用(GC-MS)进行分析。对影响萃取效果的因素(萃取时间和氯化钠的加入量)进行了考察, 并采用正交试验法对影响热脱附的3个主要因素(脱附温度、脱附时间和冷阱温度)进行了优化, 得到了较优的实验条件。对方法的重现性进行了考察, 同一样品6次测定所得30个组分的峰面积的相对标准偏差(RSD)平均值小于10%, 说明所建立方法的重现性较好。在样品中鉴别出酯类、酮类和醛类等30种不同化学组分, 这些物质反映了该香料的香气特点。实验证明SBSE和TD适用于烟用香料的快速分析测定。

关键词 [搅拌棒吸附萃取](#) [热脱附](#) [气相色谱](#); [质谱](#) [烟用香料](#)

分类号

Analysis of Chemical Components in Tobacco Flavors Using Stir Bar Sorptive Extraction and Thermal Desorption Coupled with Gas Chromatography-Mass Spectrometry

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Abstract

A novel method for the analysis of chemical components in tobacco flavors was established using stir bar sorptive extraction (SBSE) and thermal desorption coupled with gas chromatography-mass spectrometry (GC-MS). The different parameters affecting the extraction of the analytes from the samples to the poly(dimethylsiloxane)(PDMS) coated stir bars and the conditions affected thermal desorption were investigated. The optimized extraction conditions were that the sample was extracted with a stir bar (10 mm length and 0.5 mm thickness) at 1100 r/min for 1 h at ambient temperature. Desorption was carried out from 20 °C ramped to 250 °C at 60 °C/min and hold for 2 min under a helium flow of 50 mL/min in the splitless mode while maintained the cryofocusing temperature of -100 °C in a CIS-4 injector of the GC-MS system. Finally, the CIS-4 injector was raised to a temperature of 280 °C and the analytes were separated by GC and detected by MS using full scan mode (m/z 35-400). Under the described conditions, about 30 components were identified from the tobacco flavors, and the major components included esters, ketones, aldehydes, etc. The average relative standard deviation (RSD) of peak areas of 30 components for 6 determinations was less than 10%. The good repeatability made SBSE a powerful tool for the routine quality control analysis of chemical components in tobacco flavors.

Key words [stir bar sorptive extraction](#) [thermal desorption](#) [gas chromatography \(GC\)](#) [mass spectrometry \(MS\)](#) [tobacco flavors](#)

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