

超高效液相色谱-质谱联用法与气相色谱-质谱联用法分析水性印油印记的主要成分

章晴1, 邹积鑫2*, 石高军3, 张丽娟1*

1. 北京化工大学, 北京 100029; 2. 中国人民公安大学, 北京 100038; 3. 公安部物证鉴定中心, 北京 100038

Analysis of major components in water based stamp pad inks and their imprints by ultra high performance liquid chromatography-mass spectrometry and gas chromatography-mass spectrometry

ZHANG Qing1, ZOU Jixin2*, SHI Gaojun3, ZHANG Lijuan1*

1. Beijing University of Chemical Technology, Beijing 100029, China; 2. Chinese People's Public Security University, Beijing 100038, China; 3. Institute of Forensic Science, Ministry of Public Security of People's Republic of China, Beijing 100038, China

摘要	参考文献	相关文章
----	------	------

Download: PDF (211KB) [HTML](#) 1KB Export: BibTeX or EndNote (RIS) Supporting Info

摘要 应用超高效液相色谱-质谱联用技术(UHPLC-MS)与气相色谱-质谱联用技术(GC-MS),对环保水性印油中的主要成分(主要颜料与挥发性物质)进行了定性分析。通过超声提取与离心对样品进行预处理后,在ZORBAX Eclipse Plus Phenyl-Hexyl (50 mm×4.6 mm, 1.8 μm)液相色谱柱,15 mmol/L乙酸铵水溶液-乙腈为流动相,在UHPLC-MS负离子电喷雾电离条件下以选择离子监测模式定性分析染料及颜料;采用HP-INNOWAX (30 m×0.25 mm, 0.25 μm)气相色谱柱进行GC-MS全扫描,定性分析挥发性物质。研究确认水性印油中的主要颜料成分是酸性红R、水溶曙红Y与颜料红112,主要挥发性物质是甘油、1,2-丙二醇等。本方法快速、准确,可以满足物证鉴定工作中对印记的检测需要,有助于法庭科学中对印油印记的种类区分。

关键词: 超高效液相色谱-质谱 气相色谱-质谱 水性印油 印记

Abstract: Ultra high performance liquid chromatography-mass spectrometry (UHPLC-MS) technology and gas chromatography-mass spectrometry (GC-MS) technology were used to qualitatively analyze the major components in water based stamp pad inks including major colorants and volatile components. After the samples were supersonically extracted and then centrifuged, UHPLC-MS was used to separate and identify the major colorants. A ZORBAX Eclipse Plus Phenyl-Hexyl (50 mm×4.6 mm, 1.8 μm) column and 15 mmol/L ammonium acetate-acetonitrile were utilized for the separation and negative selected ion monitoring mode (SIM) was set for the MS analysis. An HP-INNOWAX (30 m×0.25 mm, 0.25 μm) column was employed in the GC-MS analysis with the full-scan mode to determine the volatiles. This study demonstrated that the major colorants in the inks and their imprints were Acid Red R, Eosin Y and Pigment Red 112| and the major volatiles were glycerol, 1,2-propanediol, etc. The method is rapid and accurate. It also demonstrates that the method can meet the requirements for imprint determination in material evidence identification. The work provides a reliable tool for the categorization research in the forensic sciences.

Keywords: ultra high performance liquid chromatography-mass spectrometry (UHPLC-MS) gas chromatography-mass spectrometry (GC-MS) water based stamp pad inks imprints

Received 2010-09-02; published 2010-12-27

Fund:

中央级公益性科研院所基本科研业务费专项资金重点项目(No. 2009JB008).

Corresponding Authors: 张丽娟,博士,副教授,主要研究方向为分析化学. E-mail: dazlj@126.com. 邹积鑫,博士研究生,助理研究员,主要研究方向为书写材料检验. E-mail: zjx81@sina.com. Email: abigail926@126.com

引用本文:

章晴1, 邹积鑫2*, 石高军3, 张丽娟1*.超高效液相色谱-质谱联用法与气相色谱-质谱联用法分析水性印油印记的主要成分[J] 色谱, 2010,V28(12): 1132-1136

ZHANG Qing1, ZOU Jixin2*, SHI Gaojun3, ZHANG Lijuan1*.Analysis of major components in water based stamp pad inks and their imprints by ultra high performance liquid chromatography-mass spectrometry and gas chromatography-mass spectrometry[J] Chinese Journal of Chromatography, 2010,V28(12): 1132-1136

链接本文:

<http://www.chrom-china.com/CN/10.3724/SP.J.1123.2010.01132> 或 <http://www.chrom-china.com/CN/Y2010/V28/I12/1132>

Service
▶ 把本文推荐给朋友
▶ 加入我的书架
▶ 加入引用管理器
▶ Email Alert
▶ RSS
作者相关文章
▶ 章晴
▶ 张丽娟
▶ 邹积鑫
▶ 石高军