

论文

固相萃取结合GC-MS系统分离分析生物体液中常见毒物药物

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摘要:

目的 研究生物体液中7类47种常见毒物药物的系统分离分析方法。方法 选用通用性较好的新型紧压式三相混合填料的固相萃取柱(SPEC Multi-Modal), 采用酸性和碱性两步洗脱, 建立同时提取血浆中几十种具不同理化性质的酸性、中性和碱性药物的系统化固相萃取方法。GC-MS系统分析方法将色谱系统的保留性质和质谱系统的特征离子、谱库检索相结合实行多指标定性。利用所选的每类药物及其代谢物代表碎片离子的质量色谱, 对几类药物及其代谢物进行筛选。结果 测定了21种常见药物毒物在血浆中的绝对回收率, 回收率均在78%以上, 相对标准偏差小于7%(n=5)。所建系统分析方法对急性中毒病人进行了定性定量分析, 取得满意的结果, 使方法在实际应用中得到了验证。结论 此方法系统性强、选择性好、灵敏度高, 结果可靠。

关键词: 固相萃取法; 多相混合固相萃取柱; GC-MS; 系统分析; 毒物药物

COMPREHENSIVE SCREENING OF DRUGS AND TOXICANTS IN BIOLOGICAL SAMPLES USING SOLID-PHASE EXTRACTION AND GC-MS

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Abstract:

AIM To develop a method for systematic analysis of 47 toxicants and drugs in plasma. METHODS A new versatile solid-phase extraction/concentrator (SPEC) plus Multi-Modal disc was selected to extract the acidic, neutral and basic drugs by two different eluents, acidic ethyl acetate and basic ethyl acetate. The determinations were programmed by combining retention time, diagnostic ions and library search. Six to eight ions per category were individually selected from the mass spectra of the corresponding drugs and their metabolites. The screening was performed using reconstructed mass chromatograms of selected ions per category. RESULTS The absolute recoveries of 21 drugs from plasma exceeded 78% with relative standard deviations less than 7% at concentrations of 20 µg*mL⁻¹ and 5 µg*mL⁻¹. The developed methods were applied to the detection of acute toxicants with good results. CONCLUSION These developed methods are simple, sensitive, rapid and reliable.

Keywords: SPEC Multi-Modal disc GC-MS systematic analysis drugs and toxicants solid-phase extraction

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