



岩矿测试

ROCK AND MINERAL ANALYSIS

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文章摘要

李忠煜, 赵江华, 何峻. 油气化探样品前处理条件对稠环芳烃测定结果的影响[J]. 岩矿测试, 2014, 33(3): 433~438

油气化探样品前处理条件对稠环芳烃测定结果的影响

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Study on the Influence of Pre-treatment Conditions of Poly-nuclear Aromatic Hydrocarbons Samples of Geochemical Exploration for Oil and Gas

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中文摘要:

在油气化探工作中, 稠环芳烃含量对区域油气异常有着重要的指示作用。对于稠环芳烃的测定, 诸多前处理条件对稠环芳烃的提取效率有显著的影响。本文研究了油气化探样品振荡提取法的多种前处理条件(提取溶剂、样品粒径、振荡时间和静置时间、提取温度)对荧光强度测定结果的影响。实验结果表明, 提取溶剂不同, 测定结果存在较大差异, 各提取溶剂的提取效率大小依次为: 二氯甲烷>正己烷>乙酸乙酯>石油醚。综合考虑溶剂背景值对测定结果的影响, 选择以正己烷为提取溶剂进行条件实验。在研究的粒径范围内, 荧光强度随样品粒径的减小而增大, 但粒径过小荧光强度反而降低, 粒径在0.125~0.090 mm之间的样品荧光强度最高; 荧光强度随着振荡时间和静置时间的增加而增强, 其中静置时间的影响较大, 静置9 h后荧光强度提高不显著; 振荡时间的影响相对较小, 振荡20 min后提取效率提高不显著; 提取温度对荧光强度的影响最为显著, 在相同条件下, 提取温度越高荧光强度越大, 且提取温度是影响稠环芳烃测定结果重现性的关键因素。油气化探样品前处理的最优化条件为: 采用粒径在0.090~0.177 mm之间的样品, 以色谱纯正己烷为溶剂, 提取温度25℃, 振荡时间20 min, 静置时间12 h。

英文摘要:

The content of poly-nuclear Aromatic Hydrocarbons is a very important index to trace abnormalities in regional oil and gas for geochemical exploration samples. The extraction efficiency of the target compounds is influenced by many pre-treatment conditions such as extraction solvents, grain size, shaking time, standing time and extraction temperature. The above-mentioned conditions were studied systematically in this research with oscillation extraction for oil and gas geochemical exploration samples. Based on research results, the solvent plays an important role in preparation. The extraction efficiency of solvents in turn from high to low are dichloromethane, *n*-hexane, ethyl acetate and petroleum ether. Considering the background effect of different solvents to measured results, the *n*-hexane was selected to study the experimental conditions. The fluorescence intensity was reduced when grain size was below 0.090 mm. Satisfactory data can be obtained when sample grain size is between

0.125-0.090 mm. The fluorescence intensity was increased simultaneously with increasing oscillation time and hold time. When the hold time extended to 9 h, the extraction efficiency was improved insignificantly. The oscillation time has a minor effect on extraction efficiency while more than 20 min oscillation time does not improve the extraction efficiency. The extraction temperature plays an important role for extraction efficiency. Under the same conditions, the fluorescence intensity was increased when the temperature was raised. The temperature is the most important factor for the repeatability test. The experimental conditions were optimized with grain size of 0.125-0.090 mm, solvent of dichloromethane, extraction temperature of 25 °C, 20 min shaking time, and 12 h hold time.

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