

激光技术

### 用激光感生击穿光谱技术测量燃煤含碳量

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摘要

研究了应用激光感生击穿光谱技术对燃煤进行元素快速定量分析的可行性。介绍了用于激光感生击穿光谱技术定量分析的定标曲线方法, 并以5种煤样作为实验对象, 选取激光击穿煤粉时碳元素505.2nm原子发射谱线为分析谱线, 定量分析了延迟时间分别为0.8μs, 1.2μs, 1.6μs, 2.0μs和2.4μs时煤粉中的含碳量, 将测量结果与元素分析仪测量结果比较, 延迟时间为1.6μs时测量误差最小。根据等离子体发射机制分析了延迟时间对定量分析的影响。实验结果表明: 激光感生击穿光谱技术的分析精度较高, 可望用于煤质特性快速检测。

关键词 [激光感生击穿光谱](#) [燃煤含碳量](#) [定标曲线](#) [延迟时间](#)

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### Measurement of carbon content in coal with laser-induced breakdown spectroscopy

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**Abstract** The feasibility of rapid quantitative analysis of coal by Laser-Induced Breakdown Spectroscopy technique was studied. The calibration curve method for LIBS quantitative analysis is introduced. Five coal samples were selected as investigation subjects, the carbon plasma line of 505.2nm was chosen as analysis spectrum line, and the carbon content of coal was analyzed quantitatively with delay of 0.8μs, 1.2μs, 1.6μs, 2.0μs and 2.4μs. The results were compared with the results measured with Element Analysis Instrument. The error measured in 1.6μs delay was the minimum, the effect of delay time on the quantitative analysis was analyzed. The results indicate that LIBS has a great potential in fast analysis of coal content.

**Key words** [laser-induced breakdown spectroscopy](#) [carbon content of coal](#) [calibration curve](#) [delay time](#)

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