

中国电机工程学报 2009, 29(5) 1-4 DOI: ISSN: 0258-8013 CN: 11-2107/TM

本期目录 | 下期目录 | 过刊浏览 | 高级检索  
闭]

[打印本页] [关

## 论文

## 内标法在激光诱导击穿光谱测定煤粉碳含量中的应用

刘彦<sup>1</sup>, 陆继东<sup>1</sup>, 李娉<sup>1</sup>, 潘圣华<sup>1</sup>, 谢承利<sup>2</sup>, 蒋梅城<sup>1</sup>

1. 华南理工大学电力学院
2. 煤燃烧国家重点实验室(华中科技大学)

## 摘要:

采用激光诱导击穿光谱(laser-induced breakdown spectroscopy, LIBS)技术测量煤粉的元素含量。将高能激光束聚焦在煤粉表面形成样品的高温等离子体, 用光纤光谱仪探测等离子体冷却过程中的发射谱线以测定煤粉的元素种类和含量。应用内标法定量分析煤粉C含量, 根据测量原理搭建了实验平台, 选取化学纯试剂C<sub>6</sub>H<sub>7</sub>NO<sub>3</sub>S、C和SiO<sub>2</sub>配制的8个混合样品作为标准样, 分别进行LIBS实验。依据内标法原理, 以Si为内标元素, 建立了C含量的定标曲线, 并利用该曲线对烟煤煤粉样C进行了定量分析。结果显示, LIBS内标法测定煤粉C含量的相对误差为1.46%, 验证了内标法应用于LIBS测定煤粉元素含量的可行性。

**关键词:** 碳含量 煤粉 激光诱导击穿光谱 内标法 测定

### Determination of Carbon Content in Pulverized Coal With Laser-induced Breakdown Spectroscopy by Internal Standard Method

LIU Yan<sup>1</sup>, LU Ji-dong<sup>1</sup>, LI Ping<sup>1</sup>, PAN Sheng-hua<sup>1</sup>, XIE Cheng-li<sup>2</sup>, JIANG Mei-cheng<sup>1</sup>

1. School of Electric Power, South China University of Technology
2. State Key Laboratory of Coal Combustion (Huazhong University of Science & Technology)

## Abstract:

Laser-induced breakdown spectroscopy (LIBS) was applied to measure the elements in pulverized coal. An intense laser radiation was focused on the surface of sample to generate a plasma plume which vaporized a small amount of pulverized coal. The emission spectrum emitted as the plasma cooling off, which contained the information of elemental species and concentration in coal, was collected and analyzed by fiber spectrometer, and internal standard method based on carbon element quantitative technique was introduced. An experiment apparatus was set up according to the principle of analysis technique. Experimental studies were carried out separately, with the standard samples which were made of chemical C<sub>6</sub>H<sub>7</sub>NO<sub>3</sub>S, C and SiO<sub>2</sub>. According to the internal standard method, and with silicon element as internal standard element, calibration curve of carbon element were constructed for quantitative determination. Afterwards, carbon element in pulverized coal sample was analyzed with the calibration curve. From the experiment results for quantitative analysis of carbon content of pulverized coal, the analysis accuracy with relative error is 1.46%, which proved that the internal standard method using in the pulverized coal quantitative analysis by laser-induced breakdown spectroscopy is applicable.

**Keywords:** carbon content pulverized coal laser-induced breakdown spectroscopy internal standard method determination

收稿日期 2008-06-19 修回日期 2008-07-05 网络版发布日期 2009-03-10

## DOI:

## 基金项目:

国家自然科学基金项目(50576029)。

通讯作者: 陆继东

## 作者简介:

## 参考文献:

## 本刊中的类似文章

## 扩展功能

## 本文信息

- Supporting info
- PDF(238KB)
- [HTML全文]
- 参考文献

## 服务与反馈

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- 引用本文
- Email Alert
- 文章反馈
- 浏览反馈信息

## 本文关键词相关文章

- 碳含量
- 煤粉
- 激光诱导击穿光谱
- 内标法
- 测定

## 本文作者相关文章

- 刘彦
- 陆继东
- 李娉
- 潘圣华
- 谢承利
- 蒋梅城

## PubMed

- Article by Liu,p
- Article by Lu,J.D
- Article by Li,p
- Article by Pan,K.H
- Article by Xie,Z.L
- Article by Jiang,M.C

文章评论 (请注意:本站实行文责自负, 请不要发表与学术无关的内容!评论内容不代表本站观点.)

反馈人

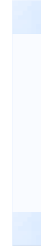
邮箱地址

反馈标题

验证码

8203

反馈内容



提交

Copyright 2008 by 中国电机工程学报