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## 基于大气压下介质阻挡放电抑制LA-ICP-MS分析中元素分馏效应研究

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**摘要:**

采用自制的大气压下介质阻挡放电装置串联在激光剥蚀池与ICP炬管之间, 对激光剥蚀产生的气溶胶进行预电离。结果表明, 元素瞬时信号轮廓的平滑度得以改善, 元素分析信号精密度(RSD, n=3)可提高2.55%。在ArF准分子激光(193 nm)和Nd:YAG 固体激光(213 nm)两种不同波长的激光剥蚀系统中, 元素分馏因子均比常规模式下更接近于1, 表明采用介质阻挡放电对气溶胶预电离后元素分馏效应得以有效抑制。相比两种不同波长的激光剥蚀系统, 介质阻挡放电对213 nm固体激光的元素分馏效应改善作用明显。

**关键词:** LA-ICP-MS 元素分馏效应 介质阻挡放电

## New Strategy Based on Dielectric Barrier Discharge Under Atmospheric Pressure to Inhibit Elemental Fractionation Effect in LA-ICP-MS

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**Abstract:**

A new strategy based on a house-made dielectric barrier discharge(DBD) device to inhibit elemental fractionation effect was developed. The DBD device was connected in between laser ablation cell and ICP torch. The aerosols induced by laser ablation were preionized in the DBD and the particle sizes of aerosol were decreased. The results indicate that elemental time-resolved signals are less fluctuant in DBD mode than normal mode during the laser ablation processes. In the ArF excimer 193 nm LA-ICP-MS, the average precision of signal intensities(RSD, n=3) with DBD mode and normal mode was 1.46% and 4.01%, respectively, and the signal intensities were reduced within 15%. While the average precision and signal intensities were found no significant change in presence and in absence of the DBD device for the 213 nm LA-ICP-MS. No obvious change was obtained for the elemental fractionation index in the 193 nm laser ablation system with the DBD device. The elemental fractionation index was closer to 1 with the DBD for 213 nm LA-ICP-MS. The results demonstrate the elemental fractionation effect was inhibited availablely with the DBD device.

**Keywords:** LA-ICP-MS Elemental fractionation effect Dielectrical barrier discharge(DBD)[扩展功能](#)[本文信息](#)[Supporting info](#)[PDF\(403KB\)](#)[\[HTML全文\]\(OKB\)](#)[参考文献\[PDF\]](#)[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](#)[LA-ICP-MS](#)[元素分馏效应](#)[介质阻挡放电](#)[本文作者相关文章](#)[张路远](#)[胡圣虹](#)[胡兆初](#)[胡明月](#)[郭伟](#)[刘勇胜](#)[张路远](#)[胡圣虹](#)[胡兆初](#)[胡明月](#)[郭伟](#)[刘勇胜](#)[PubMed](#)[Article by](#)[Article by](#)

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