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液态电极发射光谱技术在金属离子检测中应用的研究

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摘　要：

研究了采用液态电极等离子体光谱技术来实现金属离子检测的新方法。所建立的测试系统由如下部分组成：被测溶液构成的液态电极、固态对电极、高压发生装置和便携式光谱仪等。液态电极的优点是可以在常温常压下产生放电，并且也不需要复杂的液态样品进样系统，在现场检测等方面具有较大的应用前景。文中研究了放电的各种参数，如放电电压、放电电流、溶液pH值等对元素的光谱发射效率的影响。采用该测试系统，对Na+的检测限为0.1 mg/L，而对Li+, K+, Mg2+, Ca2+等离子的检测限为1 mg/L。

关键词：液态电极、放电、金属离子、发射光谱

Applications of Atomic Emission Spectrum from Liquid Electrode Discharge on Metal Ion Detection

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Abstract:

In this paper we explored the detection of metal ions by atomic emission spectrum from liquid electrode discharge. The experimental setup consists of a liquid electrode, a copper counter electrode, a high voltage supplier and a portable spectrometer, where the liquid electrode is formed by analyte solution pumped through a stainless steel needle. With liquid electrode, it is possible to generate the atmospheric pressure discharge at the relative low voltage. The emission spectra of discharge plasma are related to metal ions dissolved in the solution and thus can be used for metal ion detection. Furthermore, in this system the liquid sample is directly employed as the cathode, averting complicated vacuum and sampling systems. The influence of different discharge parameters, such as discharging voltage, current and solution pH value was investigated. With the present system, the detection limit for Na+ is 0.1 mg/L and for Li+, K+,Mg2+,Ca2+ is 1 mg/L.

Keywords: liquid electrode、discharge、metal ion、emission spectrum

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