ABSTRACT

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Basic Information

Abstract Number: 17100-500

Author Name: Kay Niemax **Affiliation:** Institute of Spectrochemistry (ISAS)

Session Title: Microplasmas: The Next Frontier of Plasma Spectrochemistry

Event Type: Symposia

Event Title: Dielectric Barrier Discharges and Hollow-Cathode-Type Discharges, Microplasmas for Optical Emission, Laser and Mass Spectrometry

Presider(s): Karanassios, Vassili **Start Time:** 16:10 (Slot # 7)

Date: 03/10/2004 **Location:** S404d

Keywords: Gas Chromatography, Mass Spectrometry, Plasma, Atomic Spectroscopy

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Abstract Content

The dielectric barrier discharge (DBD) [1,2] and the hollow cathode-type micro-structured electrode discharge (MSED) [1,2] are both plasmas which are suitable for integration in mass-produced, miniaturized analytical instruments. They are designed to serve as detectors in these devices if they are coupled with laser spectrometry (DBD) applying small size laser diodes, or optical emission and mass spectrometry (MSED) using miniaturized optical and mass spectrometers, respectively. Both µ-plasmas are sufficiently robust for GC-detection if they are operated with a noble gas. They have analytical figures of merit which are comparable to plasmas of much larger size if they are applied together with the respective spectroscopic techniques mentioned above. However, their robustness against air, water vapor or liquid aerosols is only poor, although the power densities of both plasmas are comparable or higher than, for example, of a normal-size ICP [2]. This they have in common with other micro-plasmas, since it is an inherent problem of a µ-plasmas that the ratio of outer plasma layer to plasma volume is much larger than for a normal-size plasma resulting in higher energy losses and poorer robustness. The possibilities to improve the analytical performances of miniaturized plasmas will be discussed. 1. M. Miclea, K. Kunze, J. Franzke, K. Niemax, Spectrochim. Acta, Part B 57 (2002) 1585. 2. J. Franzke, K. Kunze, M. Miclea, K. Niemax, J. Anal. At. Spectrom. 18 (2003) 802.

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