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The dielectric barrier discharge and the hollow cathode-type microdischarge, suitable microplasmas for analytical applications?

Date: Thursday, October 17, 12:04 am

Symposium: Miniaturization and Microplasmas

Topic(s): Other

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Author(s): Manuela Miclea (Presenting Author)
Kerstin Kunze
Joachim Franzke
Kay Niemax

Institution(s): Institute of Spectrochemistry and Applied Spectros

Abstract: Two small-size noble gas plasmas, a dielectric barrier discharge (DBD) and a hollow cathode-type micro-structured electrode discharge (MSED), suitable for integration in miniaturized instruments for atomic spectrometry have been studied. Plasma spectroscopy is applied to measure the physical properties of the discharges relevant for optimum atomization of molecular samples introduced into the micro-plasmas. In particular, the distributions of excited short- and long-lived atoms, the gas temperature and the electron densities have been measured with high spatial and temporal resolution applying laser absorption and spectral line analysis. The analytical figures of merit of the micro-plasmas are demonstrated by element-selective detection of halogenated hydrocarbons applying diode laser atomic absorption spectrometry and optical emission spectrometry.

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