

ANALYTICAL ASPECTS OF PLASMA PENCIL UTILIZATION

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Plasma pencil is a capacitively coupled rf jet discharge operated in argon, helium or gas mixtures at the atmospheric pressure. It was originally designed for surface modifications of cultural heritage objects. It has been also tested in analytical spectrochemistry [1, 2] as an alternative excitation source. Due to lower excitation temperatures of about 3700-4000 K it exhibits matrix interferences by easily ionisable elements (EIE) [3] and possible influence of anions from dissociated salts is investigated. E.g. the influence of EIE on Cu and Zn emission is apparently driven by excitation energies of Cu and Zn lines and ionization energies of EIE. However, the depression effect of sulfates on Zn emission is unexpectedly stronger than on Cu emission [4]. To find out if a plasma pencil can be used as an alternative excitation source drinking water samples were analyzed. The standard addition method and the calibration method were used for sodium, magnesium, potassium and calcium cations content determination. ICP-OES was also employed for the same experiments. Can be said that the results of the two discharges do not differ significantly.

References

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