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Gabriella Dravecz, Nikoletta Laczai, Ivett Hajdara, László Bencs

PII: S0584-8547(16)30275-0
DOI: doi: 10.1016/j.sab.2016.10.008
Reference: SAB 5156

To appear in: *Spectrochimica Acta Part B: Atomic Spectroscopy*

Received date: 17 June 2016
Revised date: 4 October 2016
Accepted date: 14 October 2016

Please cite this article as: Gabriella Dravecz, Nikoletta Laczai, Ivett Hajdara, László Bencs, Solid sampling determination of magnesium in lithium niobate crystals by graphite furnace atomic absorption spectrometry, *Spectrochimica Acta Part B: Atomic Spectroscopy* (2016), doi: 10.1016/j.sab.2016.10.008

Solid sampling determination of magnesium in lithium niobate crystals by graphite furnace atomic absorption spectrometry

Gabriella Dravecz[1], Nikoletta Laczai, Ivett Hajdara, László Bencs

Institute for Solid State Physics and Optics, Wigner Research Centre for Physics, Hungarian Academy of Sciences, P.O. Box 49, H-1525 Budapest, Hungary

Abstract

The vaporization/atomization processes of Mg in high-resolution continuum source graphite furnace atomic absorption spectrometry (HR-CS-GFAAS) were investigated by evaporating solid (powder) samples of lithium niobate ($LiNbO_3$) optical single crystals doped with various amounts of Mg in a transversally heated graphite atomizer (THGA). Optimal analytical conditions were attained by using the Mg I 215.4353 nm secondary spectral line. An optimal pyrolysis temperature of 1500 °C was found for Mg, while the compromise atomization temperature in THGAs (2400 °C) was applied for analyte vaporization. The calibration was performed against solid (powered) lithium niobate crystal standards. The standards were prepared with exactly known Mg content via solid state fusion of the oxide components of the matrix and analyte. The correlation coefficient (R value) of the linear calibration ~~curve~~ was not worse than 0.9992. The calibration curves were linear in the dopant concentration range of

[1] Corresponding author. E-mail: dravecz.gabriella@wigner.mta.hu; Phone: +36-1-392-2222/1684; Fax: +36-1-392-2223