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

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## 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 ( $\text{LiNbO}_3$ ) 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 (powdered) 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

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