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Determination of rare earth and concomitant elements in magnesium alloys by inductively coupled plasma optical emission spectrometry

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Abstract

An Inductively Coupled Plasma Optical Emission Spectrometry method for simultaneous determination of Al, Ca, Cu, Fe, In, Mn, Ni, Si, Sr, Y, Zn, Zr and rare earth elements (La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu) in magnesium alloys, including the new rare earth elements-alloyed magnesium, has been developed. Robust conditions have been established as nebulizer argon flow rate of 0.5 mL min⁻¹ and RF incident power of 1500 W, in which matrix effects were significantly reduced around 10%. Three acid digestion procedures were performed at 110°C in closed PFA vessels heated in an oven, in closed TFM vessels heated in a microwave furnace, and in open polypropylene tubes with reflux caps heated in a graphite block. The three digestion procedures

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