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## Development of Rapid Separation Technique Based on Hybrid Coprecipitation Method Using Magnesium as a Carrier and Its Application to Determination of Trace Elements in Salts

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### Summary

In this work, a simple separation method based on the rapid coprecipitation technique using magnesium, calcium, and indium as carrier element has been developed for determination of 27 trace elements in salt containing magnesium and calcium. To a sample solution (300 mL) containing 5 or 10 %w/v of table salt and 15 mL of 2.0 mol L<sup>-1</sup> nitric acid solution, 5 mg of indium and 0.5 mL of 0.3 mol L<sup>-1</sup> phosphoric acid solution were added. The pH in the solution was adjusted to 10 by using approximately 8 and 1 mol L<sup>-1</sup> sodium hydroxide solution; the formed precipitate, which contained magnesium, calcium, indium, and phosphate, has good sedimentation property and could coprecipitate 27 trace elements (Be, Ti, Cr, Mn, Fe, Co, Ni, Cu, Zn, Cd, Pb, Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu) quantitatively. After the solution had been allowed to settle, supernatant solution was discarded. The remaining solution containing large portion of the precipitate was transported to a 50 mL centrifuge tube and then centrifuged at 3,500 rpm for 5 min. Purified water (10 mL) was added to the tube after discarding the supernatant solution; the tube was shaken by hand. The precipitate was re-centrifuged and dissolved with 5 mL of 1 mol L<sup>-1</sup> nitric acid solution. The elements in the solution could be determined readily by inductive coupled plasma atomic emission spectrometry; indium was used as an internal standard element. The detection limits ranged from 0.001 µg (Lu) to 0.11 µg (Zn) in 300 mL of sample solutions. Operation for separation of the trace elements in the proposed method was quite simple. The proposed method was applicable to separation of the trace elements in some commercially available table salts.