

## Downsized chelating resin-packed minicolumn preconcentration for multielement determination of trace metals by ICP-MS

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### Abstrak

#### **ABSTRAK**

Chelating resin-packed minicolumn preconcentration was used for multielement determination of trace metals in seawater by inductively coupled plasma mass spectrometry (ICP-MS). The chelating resin-packed minicolumn was constructed with two syringe filters (DISMIC 13HP and Millex-LH) and an iminodiacetate chelating resin (Chelex 100, 200-400 mesh), with which trace metals in 50 mL of original seawater sample were concentrated into 0.50 mL of 2 M nitric acid, and then 100-fold preconcentration of trace metals was achieved. Then, 0.50 mL analysis solution was subjected to the multielement determination by ICP-MS equipped with a MicroMist nebulizer for micro-sampling introduction. The preconcentration and elution parameters such as the sample-loading flow rate, the amount of 1 M ammonium acetate for elimination of matrix elements and the amount of 2 M nitric acid for eluting trace metals was optimized to obtain good recoveries and analytical detection limits for trace metals. The analytical results for V, Mn, Co, Ni, Cu, Zn, Mo, Cd, Pb, and U in three kinds of seawater certified reference materials (CRMs; CASS-3, NASS-4, and NASS-5) agreed well with their certified values. The observed values of rare earth elements (REEs) in the above seawater CRMs were also consistent with the reference values. Therefore, the compiled reference values for the concentrations of REEs in CASS-3, NASS-4, and NASS-5 were proposed based on the observed values and reference data for REEs in these CRMs.