

Using multicollector ICP-MS with a desolvating nebulizer accessory for stable and radiogenic isotope ratio measurements of speleothem and marine coral samples

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Abstract

Multicollector ICP-MS instruments are widely used in geochemistry for high precision isotope ratio measurements. Signal enhancement and/or interference reduction (ex. oxides and hydrides) is often necessary for useful measurement of low abundant isotopes and mass-limited samples.

This work will describe the setup and optimization of an advanced desolvating nebulizer accessory for multicollector ICP-MS. Important accessory benefits include inert wetted components for HF-containing samples, heated inert spray chamber and membrane desolvator for optimum sample transport efficiency, and new mass flow controllers with computer software control for Ar sweep and N₂ addition gases for ease of tuning.

The nebulizer accessory is especially applicable to multicollector ICP-MS analyses for uranium-thorium dating, as is commonly used for dating speleothem and marine coral calcite and aragonite samples. System setup parameters and dating measurements will be presented for representative sample types.