

Multiple Ion Counting Using an ICP Multicollector Mass Spectrometer.

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Inductively coupled plasma multicollector mass spectrometers are extremely versatile isotope ratio analysers. The versatility of the technique owes much to the plasma source as it can be used to ionise material from solutions or from solids via laser ablation. Typically, the detectors used are Faraday cups in the STATIC multicollection mode, this allows high precision measurements to be made even with unstable ion signals. However, the use of Faradays limits the measurements to concentrations in the ppt or above concentration range. For smaller samples ion counting is required, and while this is useful, for example in isotope dilution analysis, there is still a restriction in the ability to measure transient signals. Multiple ion counting is an obvious solution whereby signals of a few thousand cps (which is comparable to the noise on a Faraday cup) can be measured. An array of conversion dynode multipliers has been developed to allow ion counting multiple collection. This system delivers simultaneous measurement, of, for example, Pb and U isotopes, at the femtogram level.

We will present data on U standards both from solution and by laser ablation ICP-MS. We will also present Pb isotope ratio data from zircons using these detectors.