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Helix MC Plus high resolution noble gas mass spectrometer at the Australian National University

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The Helix MC *Plus* noble gas mass spectrometer manufactured by Thermo Fisher Scientific is a 350 mm sector, 120 degree, extended geometry, high resolution, multi-collector mass spectrometer for simultaneous acquisition of noble gas isotopes. The Helix MC *Plus* installed at the Australian National University (ANU) is unique in that it is equipped with three high resolution collectors with 0.3 mm defining slits on the axial (Ax), the high mass (H2) and the low mass (L2) detectors. In contrast, the H1 and L1 detectors are equipped with low mass resolution 0.6 mm collector slits. High mass resolution (>1,800) and mass resolving power (>9,000) achieved with the high resolution collectors make this mass spectrometer unique in analysing noble gas isotopes. It provides the capability to measure isobaric interference free noble gas isotopes in a multi-collector mode, which significantly improves the accuracy to determine isotopic ratios and greatly increases the efficiency of data acquisition. These features will be summarised in the presentation. The Helix MC *Plus* mass spectrometer at ANU is equipped with four movable detector modules, allowing the four detector positions (H2, H1, L1 and L2) to be adjusted. In order to measure a full suite of noble gases automatically from He to Xe, it is necessary to implement automation of detector positioning for each of noble gas element. This presentation will provide the details of the development of the detector automation currently carried out at ANU, including development of the motorised cup actuators, controller and the software.

Biography

Xiaodong Zhang completed his PhD in physics from La Trobe University in 1994. He has been working in noble gas mass spectrometry for 20 years. He is currently working in the noble gas laboratory at the Research School of Earth Sciences in the Australian National University. He has expertise in mass spectrometry, ultrahigh vacuum technology and laboratory automation.

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