

CAMECA IMS 1300-HR³: a versatile ion microprobe for Geosciences

A. VUILLAUME, P. PERES, S.-Y. CHOI,
F. FERNANDES, L. RENAUD

¹ CAMECA, 29 quai des Grésillons, 92230 Gennevilliers
Cedex, France. email: paula.peres@ametek.com

The success of secondary ion mass spectrometry (SIMS) in Geo- and Cosmo-chemistry relies on its performance in terms of: 1) very high sensitivity (mandatory for high precision measurements or to achieve low detection limits); 2) a broad mass range of elemental and isotopic species, from low mass (H) to high mass (U and above); 3) in-situ analysis of any solid flat polished surface; and 4) high spatial resolution from tens of microns down to sub-micron scale.

The IMS 1300-HR³ model combines the well-proven features of the former IMS 1280-HR with new developments that offer a unique combination of High Reproducibility at High spatial Resolution and High mass Resolution. The 1300-HR³ delivers unmatched analytical performance for a wide range of applications: tracking geological processes using stable isotopes, dating minerals, determining the content of trace elements, screening and analyzing large numbers of particles...

High density cesium or oxygen primary ion beam bombardment combined with optimized transmission allow high precision stable isotope studies and analysis of trace elements at high sensitivity (e.g. mandatory for Pb analyses in Zircon). The multicollector system ensures ultimate reproducibility for stable isotope ratio measurements (H, C, O, S, Li, B, Mg...) and significantly increases the throughput of the instrument by reducing the total acquisition time.

The IMS 1300-HR³ ion microprobe provides both microscope and microprobe imaging. Thanks to these superior imaging capabilities, the instrument is capable of mapping the distribution of major, minor and trace elements or isotopes at sub-micron lateral resolution.

Hundreds of scientific papers have been published covering major application fields in geo- and cosmochemistry, geochronology, environmental studies,... A review of recent analytical data obtained with CAMECA large geometry magnetic sector ion microprobe on different domains will be presented.