

# Large Geometry Secondary Ion Mass Spectrometer in Geoscience: Methodology Development and Applications



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Secondary Ion Mass Spectrometry (SIMS) is a major technique employed in geochemistry and cosmochemistry. The basis of the secondary ion mass spectrometry (SIMS) technique is the phenomenon where bombardment of a solid by a primary ion beam generates secondary ions. The secondary ions, analyzed for their mass-to-charge ( $m/z$ ) ratios in a mass spectrometer, in turn reflect some compositional attribute of the solid samples. SIMS is an enormously widespread technique in the physical sciences and has many uses, including 'bulk' chemical or isotopic analysis from microvolumes, imaging of element distributions, measuring compositional changes with depth, and surface molecular chemistry. The key advantages of SIMS are the ability to localize the analyses to the micro- and even nano-scale, the very low detection limits, and access to the entire periodic table. This talk will focus on current activities of the Guangzhou Institute of Geochemistry (GIG) large geometry SIMS facility, including analytical methodology development, standard reference material development and their geoscience applications including but not limited to the evolutions of the Paleotethys Ailaoshan ocean, Central Asian Orogenic Belt (CAOB), South China Block and genesis of iron oxide-copper-gold (IOCG) mineral deposit in Peru.



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