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Super-SIMS at HZDR - first steps

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The integration of an ion source with very high spatial resolution with a tandem accelerator is a long-standing concept for improving analytical selectivity and sensitivity by orders of magnitude [1-3]. Translating this design concept to reality has its challenges [e.g. 4-6]. Supporting a strong focus on natural, metallic and mineral resources the, Helmholtz Institute Freiberg for Resource Technology installed such a system at the Ion Beam Centre at HZDR. This so-called Super-SIMS will be at the core of a comprehensive pallet of micro-analytical methods devoted to the characterization of minerals and ores. Secondary ion beam from a CAMECA IMS 7f-auto are injected into the pre-existing 6MV Dresden Accelerator Mass Spectrometry facility [7,8], which quantitatively eliminates isobaric molecular species from the ion beam. Our SIMS component can function as either a stand-alone device or can be used to inject the negatively charged secondary ions at energies of up to 40 keV (to match the acceptance conditions) into the accelerator. A dedicated ion optical unit has been constructed and installed to match the SIMS ion beam to the maximum acceptance of the accelerator.
We will present measurements of the performance parameters of the instrument as well as first results of halogen (F, Cl, Br, and I) determinations in galena, sphalerite and pyrrhotite.
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