Protocol for SIMS analysis at ICMCB

The protocols are for post-test analysis of micro-samples derived from operated cells/tacks.

SIMS experiments were carried out using a Time of Flight Secondary Ion Mass Spectroscopy (TOF-SIMS) device from Ion ToF Company (Tof SIMS5). This technique uses a pulsed ion beam (here Bi^+) to remove both atoms and molecules from the sample surface (<4 monolayers). The secondary ions removed from the surface are then extracted and accelerated by an electrical field and their masses are then determinate by measuring their time of flight over the analyser to reach the detector. A sub-micrometric in-plane spatial resolution is provided (c.a. 150 nm), being the in-depth resolution on the order of nanometres. In this study, an area of 1 mm^2 was averaged, using a focused 25 kV beam.

The analysed areas are in-between 50 and 500 μm^2.

It's important to note that the sputtering do not induce roughness.

Two main analysis modes were used: i) The Bunch mode who gave the best mass resolution and the best sensitivity, ii) The Burst mode gave the best compromise between intensity and lateral resolution, but to the detriment of sensitivity.