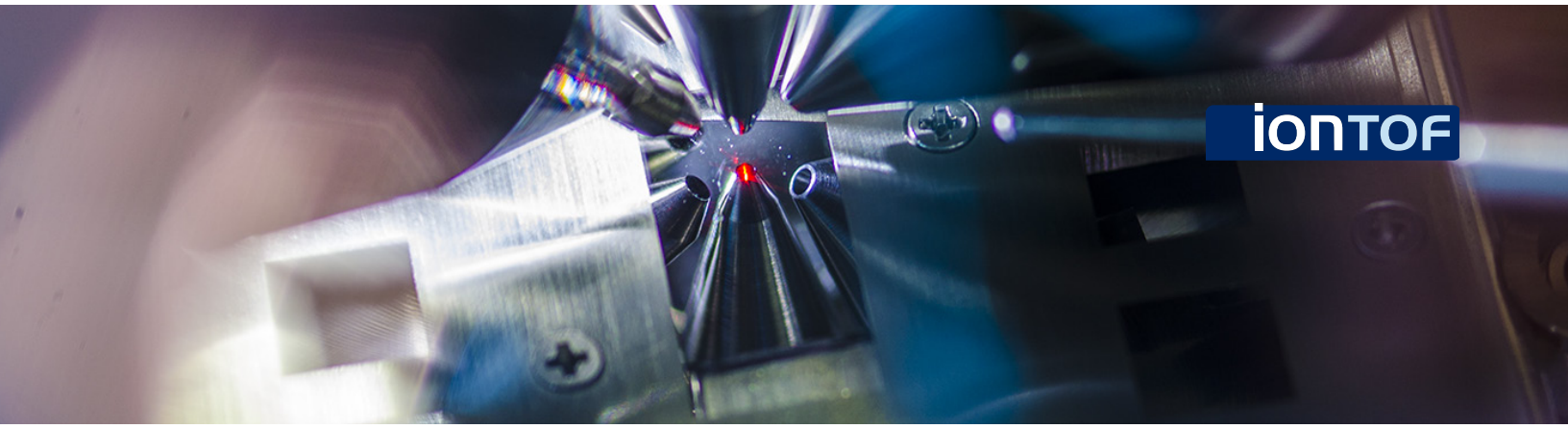

Mass Accuracy and Mass Resolution

High mass accuracy for unambigious peak identification

Transmission, mass resolution and mass accuracy are the most essential figures of merit for a time-of-flight mass analyser. The IONTOF reflectron mass analysers feature high transmission in combination with high mass resolution which are both achieved simultaneously and without compromize.

Furthermore, the achievable mass accuracy is the important prerequisite for unambiguous peak identification. The IONTOF mass analysers have an absolute linear mass scale and provide superior mass accuracy of less then 10 ppm without the need to tune additional field shaping voltages.

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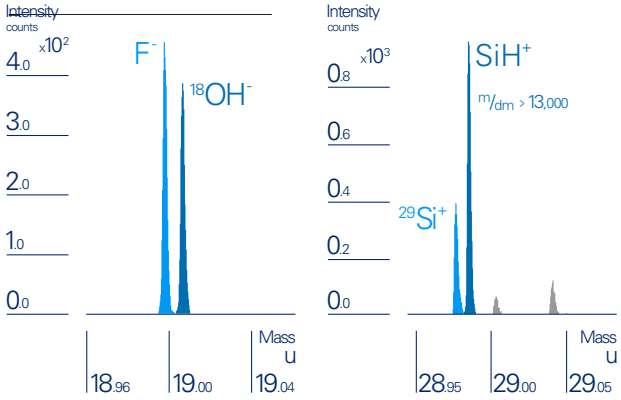
Simultaneous high mass resolution and sensitivity

The IONTOF SIMS instruments are equipped with a gridless reflectron type time-of-flight analyser. The non-linear design provides very high transmission and mass resolution in both positive and negative SIMS. No apertures or slits need to be narrowed to achieve this level of mass resolution. The instrument operates with full transmission at all times.

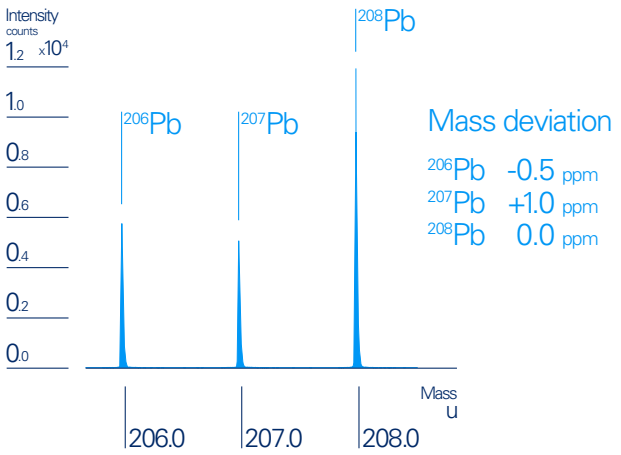


High resolution mass spectra in positive and negative secondary ion mode. Both spectra were acquired using Bi_1^+ as primary ion species.

Unambiguous peak identification

At the same time the analyser provides ppm mass accuracy. The example below shows the different lead isotopes detected on a silicon wafer. The positive, high-resolution spectrum was acquired using Bi_1^+ as primary ion species. The time-of-flight analyser was operated in standard mode after a fully automated Z and alignment adjustment.

For the mass calibration the following unsaturated hydrocarbon species were used: CH_2^+, CH_3^+ $C_2H_2^+$, $C_2H_3^+$ and $C_7H_7^+$. The mass accuracy was determined using the different lead isotopes. The measurement clearly shows a mass accuracy of less than 1 ppm for all peaks without any reduction in mass resolution. The same level of accuracy is also achieved in negative SIMS mode.



High resolution mass spectra in positive secondary ion mode showing the different Pb isotopes on a silicon wafer.