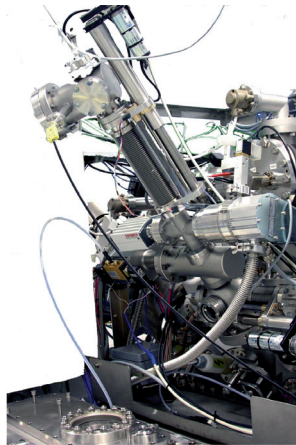


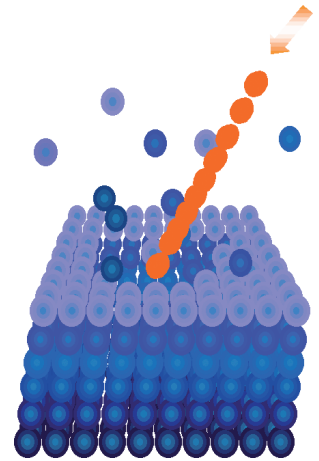
SC Ultra:

SIMS analysis with ultimate depth resolution

The **Cameca SC Ultra** is dedicated to perform depth-profiling with optimized depth resolution. By sputtering at Ultra-Low Energy under well controlled conditions (species, angle, gas flooding), analytical parameters are optimized for ultra-shallow depth profiling. To reduce the lack of quantification due to the matrix effect of the SIMS technique, a neutral cesium gun has been installed on this instrument ^[1].



Neutral cesium column
on SC Ultra

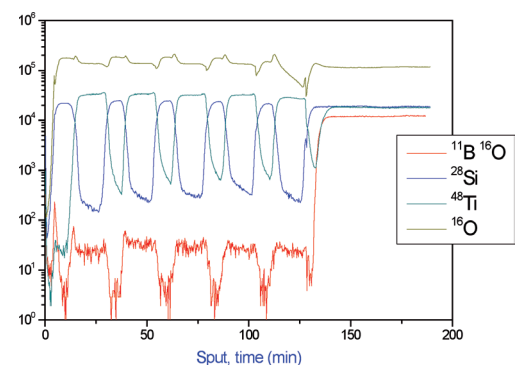


Cameca SC Ultra

- Depth resolution: 1nm
- Detection limits: ppb to 100 %
- Elemental range: H to U
- Major use: depth profiling
- Optimization of the limit of detection: deposition of neutral cesium

Unique advantages of the technique

- High elemental and isotopic depth resolution
- Low impact energy of the primary beam, down to 250 eV
- Extreme sensitivity
- Roughness control (sample rotation, oxygen flooding)
- Optimization of the secondary ion emission using the neutral cesium column

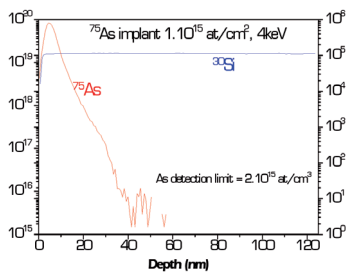


Depth profiles for sample TiO/SiO/etc./
SiO₂, obtained with 2keV impact energy
and sample rotation.

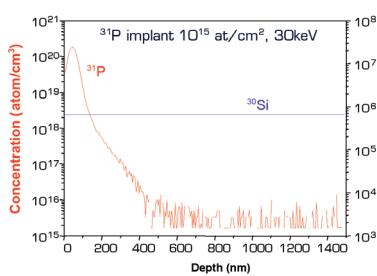
^[1] CRP - Gabriel Lippmann's Patent: International application

Semi-conductors

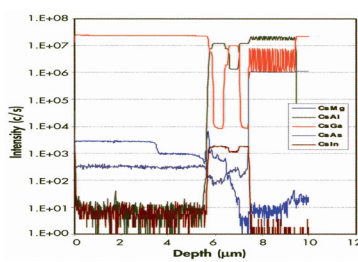
Ultra-shallow depth profiling



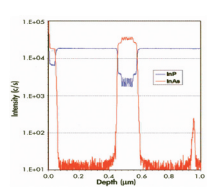
As implanted into Si,
analysis using Cs⁺ and
500eV impact energy



P implanted into Si,
analysis using Cs⁺ and 2keV
impact energy



III-V compounds analysis

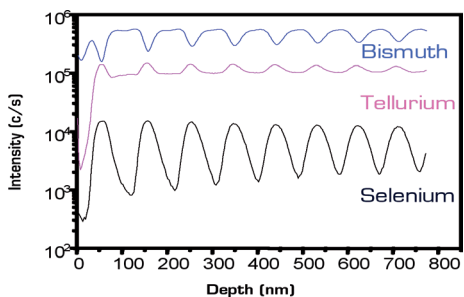


Detection of trace elements and quantification of dopant with high depth resolution.

Examples of detection limits in silicium:

Element	Bombardment	Detection limit (at./cm ³)	Impact energy (keV)
B	O ₂ ⁺	5.10 ¹⁵	0.5
B	O ₂ B ₂ ⁺	5.10 ¹³	10
As	C _s ⁺	2.10 ¹⁵	0.5
As	C _s ⁺	5.10 ¹³	13
P	C _s ⁺	3.10 ¹⁵	2
P	C _s ⁺	5.10 ¹⁴	13

Inorganic materials

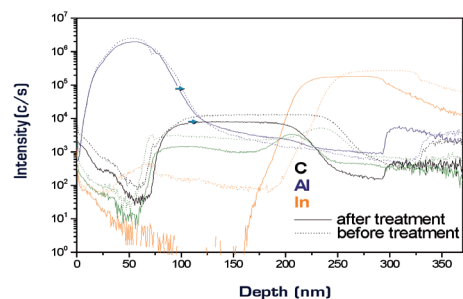


Analysis of a multilayer of
Te/Bi/Se and Te/Bi layers

Multilayer analysis in:

- Ceramics
- Alloys
- Glasses
- Composites

Polymers



Determination of the diffusion of metallic Al
in polymer layer after heat treatment

Polymer analysis in:

- Coatings
- Multilayers