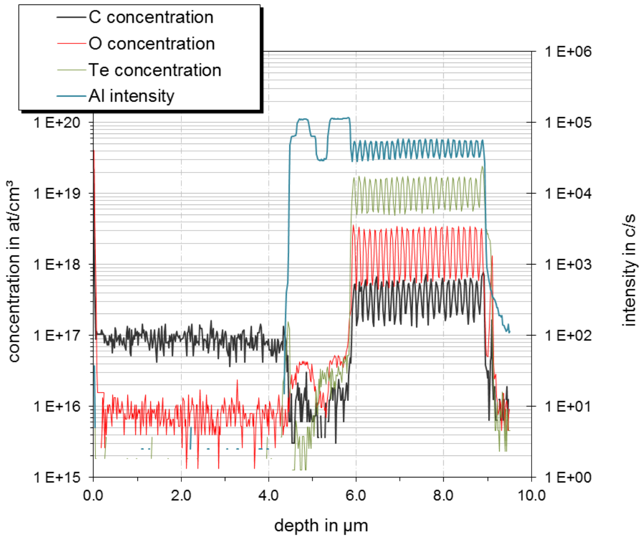
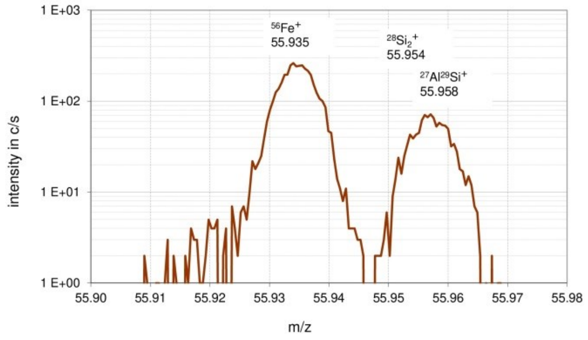
RTG Mikroanalyse GmbH Berlin
Dienstleistungslabor für Sekundärionen-Massenspektrometrie

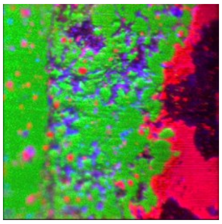
SIMS Analytics of Dopants, Impurities and Matrix Compositions



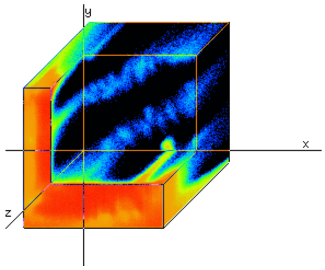
Quantification of dopants and impurities in layer systems: Depth profile of the C, O, and Te concentrations on the InGaAlP-AlGaAs layer system of a LED.



High resolved mass spectrum



Lateral element distribution
of a biological Titanium implant
(Ti - green, Na - blue, Ca - red)



Three dimensional
distribution of oxygen in
silicon

Main Applications

- Quantification of dopants and impurities
  - ➢ Access to a huge pool of calibration standards
- Quantification of matrix compositions
- Depth profiling
- Mapping
- Space-resolved element quantification
- Three dimensional analyses of microvolumes
- Mass spectra
- Failure analyses

Materials (Selection)

- III/V Semiconductors (GaAs, GaN, GaP, InP, ternary, quaternary)
- Silicon, germanium, silicides
- II/VI semiconductors (CdTe, ZnO, ZnSe)
- Optical multilayers
- Metal layer structures, contact systems
- Solar cells (Si, CIGS, CIGSe)
- Metal ceramic and ceramic ceramic compound systems
- Polymers
- Medical and biological samples (implants, dental materials)

Strengths of SIMS

- High sensitivities
- Very low detection limits (ppm and below)
- Depth profiles with high depth resolution (1 nm) and low detection limits
- Detection of any chemical element, from H to U
- High lateral resolution (1µm)
- High dynamic range (6 orders of magnitude)

Limitations of SIMS

- Destruction of the sample surface
- Mixing and recoil processes
- Topografical effects, surface roughness
- High variation of ionisation cross sections
- Matrix dependence of detection sensitivities
- No information about chemical bonds
- Solid and vacuum resistent samples are required

RTG Mikroanalyse GmbH Berlin
Schwarzschildstraße 1
12489 Berlin, Germany

Web: www.rtg-berlin.de
E-mail: info@rtg-berlin.de
Phone: +49 (0)30 6392 1146