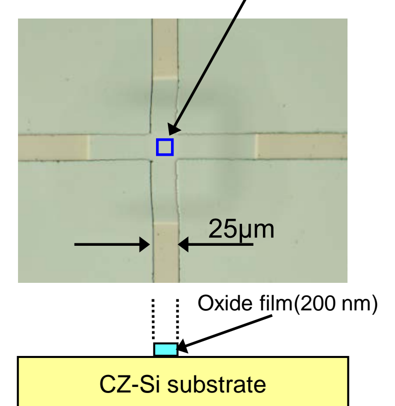
Depth profiling of impurities in the small patterned Si by highly sensitive TOF-SIMS

We measured the depth profiling of impurities in the small area of 15 μm or less than 10 μm width, using highly sensitive TOF-SIMS. TOF-SIMS is a powerful technique to be able to obtain some information about the depth profiling of impurities in the small patterned Si devices.

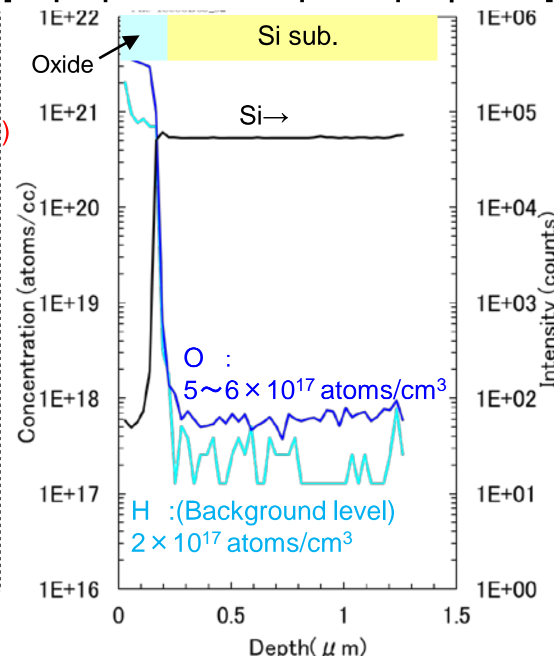
1. Depth profiling of H and O in the 15 μm□ pattern of CZ-Si by highly sensitive TOF-SIMS

[Optical microscope image and cross-sectional structure]

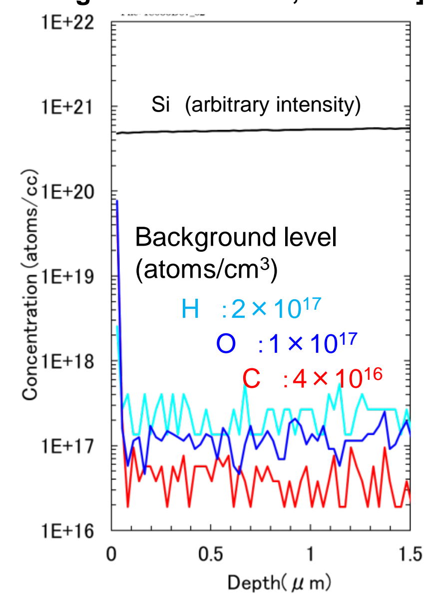
Analytical area : 15 μm× 15 μm
(=area extracted for depth profiling)



[Depth profiles in the 5μm× 5 μm pattern]



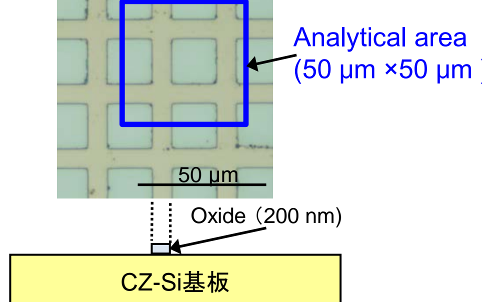
[Depth profiles in the FZ-Si performed in order to check background level of H, C and O]



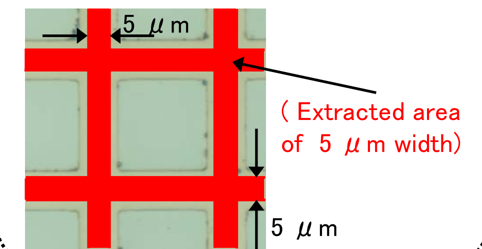
We can detect H, C and O in Si substrate with the detection limit of ppm order, even in the small area of 15 μm×15 μm for semi-conductor, using highly sensitive TOF-SIMS.

Depth profiling of As and P in the patterned Si of 5 μm width by highly sensitive TOF-SIMS

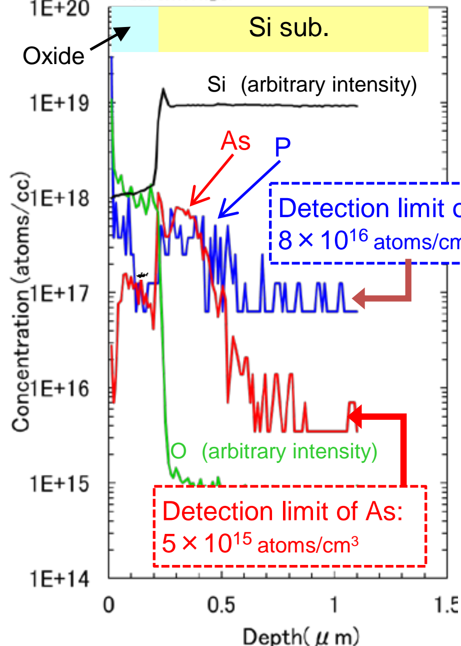
[Optical microscope image and cross-sectional structure]



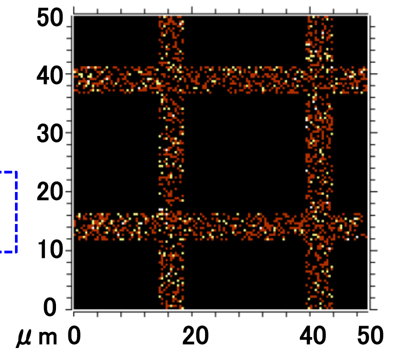
[Extracted area of depth profiling]



[Depth profiles]



[Secondary ion image of As]



We achieved detection limits of sub-ppm for As and a few ppm for P in the patterned area with 5 μm width of Si substrate, using highly sensitive TOF-SIMS.