Atom probe tomography and the analysis of semiconductors and insulators*

Sébastien Duguay

GPM, Université et INSA de Rouen, Saint Etienne du Rouvray, France

High resolution 3D atomic imaging and spectroscopy capabilities are now required to image structures whose complexity tends to be inversely proportional to their sizes. Among all characterisation techniques now available, APT is one of the most promising tools thanks to its unique capability to combine atomic scale resolution in 3D with quantitative chemical analysis in large areas of analysis (up to $100\,nm^3$). In this context, the role of atom probe tomography (APT) in microelectronics is discussed on the basis of various illustrations, from dopant distribution and segregation to defects in silicon to the analysis of insulating materials like SiO_2 containing Si nanoparticles. The physic of the technique as well as its advantages and drawbacks will be discussed.

References

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