3D Imaging of an Organic Matrix via FIB-TOF Tomography

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3D chemical and molecular imaging of an organic matrix via the FIB-TOF method will be discussed with examples. We have previously demonstrated the capability to achieve 3D imaging by the combination of TOF-SIMS imaging with *in situ* FIB milling and sectioning…what we have called FIB-TOF. It has been shown that there are specific advantages to 3D TOF-SIMS imaging via the FIB-TOF method in lieu of the traditional sputter depth profile approach. The complications of sputter depth profiling to achieve 3D imaging are differential sputtering (i.e. preferential sputtering), and accumulated beam damage in the case of an organic matrix. These difficulties, and the analytical limitations that are imposed as a consequence, are briefly explored with examples. FIB-TOF analysis of large volumes may be achieved in a timeframe that is commensurate with a comparable sputter depth profile. The use of a jet of water vapor in conjunction with both TOF-SIMS analysis and FIB sectioning will be discussed concerning its effect on secondary ion yield, FIB sputter rate, and residual FIB damage.