

Nanocone Chemical Analysis with Scanning Auger Microscopy

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The recent dramatic increase in nanotechnology research has pushed the development of analytical techniques to elucidate the growth mechanisms of nanostructures. Scanning electron beam techniques, including Scanning Auger Microscopy, have provided valuable imaging and elemental characterization tools for these structures with a spatial resolution better than 10 nm. To enhance the Auger analysis for nanocones, high energy resolution chemical state spectroscopy and imaging has been combined with the imaging capabilities of a CMA based Scanning Auger. Using a combination of these Auger analytical capabilities, the analysis of nanocones grown by plasma enhanced chemical vapor deposition reveals a non-uniform chemical composition between several different nanocones. The quantitative elemental analysis as well as the imaging of different chemical states has been obtained without imaging artifacts induced by the shapes of the vertically oriented nanocone structures. These results provide further insights into the nanocone growth mechanisms.