Aberration Corrected Analytical Electron Microscopy of Catalysts and Other Nanostructured Materials

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The recent availability of aberration (C_s) corrected analytical electron microscopes is revolutionizing our ability to characterize the morphology, crystallography and chemical composition of nanoscopic volumes of materials. In this presentation the different kinds of structural information available from high resolution lattice imaging and C_s corrected annular dark field imaging of supported catalyst nanoparticles will be compared and contrasted. The combination of X-ray Energy Dispersive Spectroscopy (XEDS) spectrum imaging and multivariate statistical analysis (MSA) will then be discussed in relation to its applicability to bimetallic catalyst particles. Finally examples of recent aberration corrected STEM-electron energy loss spectroscopy (EELS) point and spectrum image analyses of semiconductor hetero-interfaces, complex oxides, ordered metallic alloys and grain boundary segregation effects will be presented to further illustrate the new analytical capabilities at our disposal.

Keywords: analytical electron microscopy, aberration correction, catalyst nanoparticles

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