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Chemical contrast in Near-Field-Emission SEM LORENZO GIUSEPPE DE PIETRO, MANFRED THALMANN, HUGO CABRERA, DANILO ANDREA ZANIN, URS RAMSPERGER, DANILO PESCIA, Laboratory for Solid State Physics, ETH Zurich, Switzerland — In Near-Field-Emission SEM the primary electron beam, of some tens of eV, is generated by cold field emission from a polycrystalline W-tip. Recently, topography images have been obtained by scanning a W(110) sample with a tip at constant height, typically of tens of nm, recording the secondary electron yield and the emission current. We report on the observation of a chemical contrast of a W(110) surface covered by submonolayer of Fe achieved with the NFESEM technique. The chemical contrast is caused by a significant lower secondary electron yield for Fe with respect to W. The Fe islands with a diameter of 2 nm to 5 nm are clearly distinguishable, giving a direct indication of the microscope lateral resolution. The adsorbate position, size and shape are confirmed by STM. Moreover, this technique shows the presence of Fe growing along the step edges of the substrate, which can not be identified with STM.

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