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Photoemission spectromicroscopy with synchrotron radiation

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Utilizing a photoemission electron microscope (PEEM), we studied fully formed metal-semiconductor interfaces with a resolution better than 2 mm. Due to their escape depth (around 100E), the photoemitted secondary electrons bring chemical information about the interfaces. Secondary photoelectron microimages taken with ultraviolet and soft x-rays revealed lateral changes in photoyield efficiency and chemical composition in chemically etched and sulfur passivated GaP(100) surfaces covered *ex-situ* with 80 E of Pt. The radiation source was a deuterium lamp (continuous emission spectrum up to about 6.7 eV) or the radiation from ELETTRA's U12.5 undulator. The use of tunable synchrotron radiation provided the characterization possibility to obtain image contrast by digital subtraction, using photon energies above and below core-level binding energies. The PEEM showed attractive possibilities for high spatial resolution studies of metal-semiconductor reaction processes also in buried interfaces. PEEM results were confirmed by spatially resolved x-ray spectroscopy measurements using Al K_{α} radiation.