TXRF-XANES TRACE ANALYSIS OF ORGANIC AND LOW Z COMPOUNDS ON SI WAFER SURFACES EXCITED BY MONOCHROMATISED UNDULATOR RADIATION

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Monochromatised synchrotron radiation is a well known tool for the investigation of near edge x-ray absorption structures (XANES). Combining XANES with total reflection x-ray fluorescence (TXRF) spectroscopy, impurities of low Z and organic compounds on silicon wafer surfaces can be characterised. The plane grating monochromator beamline for undulator radiation of the Physikalisch-Technische Bundesanstalt (PTB) at the third generation electron storage ring BESSY II, which provides photon energies between 0.1 keV and 1.9 keV for the specimen excitation, is an ideal excitation source for XANES-TXRF experiments offering the necessary high resolving power and a sufficient photon flux for trace analysis of low Z elements. Wafers have been intentionally contaminated with NaSCN, NaCNO, stearic acid and naphtaline-1,3,6-trisulfonic acid Na-salt diluted in water or propanol and deposited as droplets. C, N, O XANES spectra of the substances and of the blank (water and propanol) have been measured and compared. Initial results showing the potential of this method for distinguishing trace amounts of organic matter on Si wafers will be presented.