

DS 3 Dünnschichtanalytik II

Zeit: Freitag 12:00–12:45

Raum: TU H107

Hauptvortrag

DS 3.1 Fr 12:00 TU H107

X-ray absorption studies of hard coatings in the boron-carbon-nitrogen — •R. GAGO¹ and I. JIMENEZ² — ¹Institut für Ionenstrahlphysik und Materialforschung, Forschungszentrum Rossendorf, 01314 Dresden (Germany) — ²Instituto de Ciencia y Tecnología de Polimeros (CSIC), 28006 Madrid (Spain)

X-ray absorption near edge spectroscopy (XANES) is a powerful characterisation technique that provides information about the density of unoccupied electronic states of molecules and solids. In the case of thin films, such electronic information can be correlated with the bonding structure and orientation of bonds, even in amorphous or nanostructured films. Particularly, in the electron or photon yield detection modes, XANES does not require special sample preparation procedures, making the measurements fast and easy. XANES is especially suited to study the bonding structure of compounds of light elements, as is the case of the boron-carbon-nitrogen (BCN) system since it gives distinct spectral signatures for sp^2 and sp^3 hybrids. In this work, we review our results during the last years regarding XANES studies of hard coatings within the BCN system, i.e. diamond, amorphous carbon (a-C), carbon nitride (CN_x) and ternary BCN compounds. Mainly, bonding structure (sp^2/sp^3) and phase segregation issues are addressed. Finally, it is shown that XANES is also sensitive to microstructural features like preferential orientation and curvature of basal planes, the latter referred commonly as fullerene-like arrangements.