

Synchrotron-based spectromicroscopic analysis of diamond-like carbon films

The principle of synchrotron-based spectromicroscopy techniques, sample requirements, typical measurement, and data analysis is presented. Particularly, the combination of photoemission electron microscopy (PEEM) and near edge X-ray absorption fine structure (NEXAFS)/X-photoelectron spectroscopy (XPS) is a spectromicroscopy technique using synchrotron light source to characterize the chemical information of diamond-like carbon (DLC) films and related materials. The PEEM and NEXAFS/XPS techniques enables us to make a sensitive evaluation of the surface structure together with the chemical states. It has become a valuable tool for the investigation of corrosion and wear traces on DLC films. The main part deals with DLC applications relating to several industries, for example, automotive parts, medical devices, packaging, cutting tools, and hard disk drive, to give an impression of the capabilities of the method over a wide range of research and technological problems.

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