PANI film on carbon nanowalls: synthesis and analysis

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Résumé

The interest in the novel, often carbonaceous materials with large effective surfaces, high conductivity, stability, is growing due to the downsizing of electrical devices and the demand for low-cost new materials.
These demonstrate many potential applications such as electrochemical devices, storage materials for gas, transistors, and biosensors.

In this work, the synthesis and analysis of CNWs and graphene nanocomposites synthesis, such as Polyaniline (PANI) – CNWs composites, will be presented. A possible application of CNWs and PANI-CNWs nanocomposites is in carbon based microelectronic parts of biosensors. CNWs are produced by low-temperature plasma procedures, supported by prior annealing within the same system. The plasma properties during annealing, growth process, and polymer deposition were chosen in order to obtain the best conditions and minimum material damage. The material structure, e.g. morphological, chemical, and microstructural features, is revealed by employing near edge X-ray absorption fine structure (NEXAFS) spectroscopy, in combination with X-ray photoelectron spectroscopy (XPS), on the HE-SGM beamline at the synchrotron radiation facility BESSY II in Berlin (Germany). NEXAFS is a unique method to obtain information on the surface states (bonding states, a fingerprint of materials).

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