

ALIGNMENT TEST OF N-DOPED CARBON NANOTUBES USING HIGH-ENERGY X-RAY DIFFRACION

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Alignment test of multi-wall N-doped carbon nanotubes prepared by template pyrolytic carbon deposition method inside channels of an alumina membrane have been performed using high-energy X-ray diffraction on the ID15B beam-line at the European Synchrotron Radiation Facility (ESRF, Grenoble). The two-dimensional diffraction pattern of deposited carbon nanotubes, recorded directly within the alumina membrane using image plate detector, exhibits two non-continues arcs corresponding to the (002) graphitic reflection. Four values of angle between the axis of

carbon nanotubes within membrane channels and the incident beam were taken into consideration (0, 30, 45 and 60 degree). The anisotropic scattering distribution of two-dimensional pattern corresponds to the appropriate position of the carbon nanotubes, thus indicates their alignments. The one-dimensional intensity pattern for (002) anisotropic peaks over whole azimuthal angle was performed by circular slicing the two-dimensional pattern and the Full Width at Half Maximum (FWHM) parameter of anisotropy effect was determined by procedure of non-linear Gaussian curve fitting.