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ONLINE ISSN : 1348-2246

PRINT ISSN : 0910-6340

**Analytical Sciences**

Vol. 26 (2010) , No. 2 p.267

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## Structure of Ultra-Thin Diamond-Like Carbon Films Grown with Filtered Cathodic Arc on Si(001)

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(Received September 1, 2009)

(Accepted December 8, 2009)

The structure of 3 nm and 15 nm diamond-like carbon films, grown on Si(001) by filtered cathodic arc, was studied by angle-resolved X-ray photoelectron spectroscopy (ARXPS) and transmission electron microscopy (TEM). The ARXPS data was deconvolved by employing simultaneous-fitting, which allowed for a clear deconvolution of the Si 2p and C 1s spectra into their different chemical contributions. An analysis of the take-off angle dependence of the peak intensities allowed for an independent identification of the physical origin of the chemical species. It was shown that the C 1s peak at 283.3 eV and the Si 2p peak at 99.6 eV correspond to SiC, and that the C/Si interface of the 3 nm film consists of a stoichiometric ~1 nm SiC layer. To quantify the sp<sup>3</sup>-sp<sup>2</sup> ratio it was necessary to take into account not only their associated C 1s XPS-peak intensities, but also their take-off angle dependence. The thickness of the films obtained through ARXPS closely agrees with cross-sectional TEM images.

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To cite this article:

Alberto HERRERA-GOMEZ, Yongjian SUN, Francisco-Servando AGUIRRE-TOSTADO, Cherngye HWANG, Pierre-Giovanni MANI-GONZALEZ, Eric FLINT, Francisco ESPINOSA-MAGAÑA and Robert M. WALLACE, *Anal. Sci.*, Vol. 26, p.267, (2010) .

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doi:10.2116/analsci.26.267

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