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# Preparation of diamond-like carbon films by double cathodes pulse glow discharge plasma vapor deposition

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## Abstract

Hydrogenated diamond-like carbon (DLC) films were deposited on silicon chip by double cathodes pulse glow discharge plasma vapor deposition at different gas flow rates. The surface morphology, composition and microstructure of films was observed by atomic force microscope (AFM), X-ray photoelectron spectroscopy (XPS) and spectroscopy Raman spectrometer. The Raman spectra of a-C:Hs show different trends. It was found that different systems exhibit different positions of G peak, D peak, G peak full width at half maximum (FWHM(G)), as well as different I(D)/I(G) values and sp<sup>3</sup> bond content. In one case, when H<sub>2</sub>:Ar:C<sub>2</sub>H<sub>2</sub> gas volume ratio is from 4:1:1 to 8:1:1, the positions of G peak and D peak are slightly upward, the I(D)/I(G) values decrease with increasing sp<sup>3</sup> bond content. In the second case, both sp<sup>3</sup> bond content with FWHM(G) have the different trends are found, they do not have a consistent linear relationship.

**Keywords:** Raman spectroscopy, pulse glow discharge method, DLC, coatings

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