

# Imparting Superhydrophilicity to Diamond-Like Carbon by Plasma Surface Treatment Technique

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(Received 2 May 2007; accepted 12 October 2007)

**Key words:** diamond-like carbon, hydrophilic, X-ray photoelectron spectroscopy

The surfaces of medical materials are coated with polymer molecules or drugs in order to functionalize the surfaces in ways such as imparting biocompatibility. However, in the case where the medical materials are inorganic, there is the problem that they will have poor adhesiveness to polymers and be liable to peel. For coronary artery stents, the authors succeeded in developing a method of rendering a diamond-like carbon (DLC) film surface hydrophilic by using plasma surface treatment techniques, with the purpose of enhancing such a surface's adhesiveness to a stent base material of drug-containing polymer that enables imparting of functions such as biocompatibility. In this method, the DLC surface is first irradiated with acetylene (C<sub>2</sub>H<sub>2</sub>) plasma so as to cleave the carbon-carbon bonds and create reactive sites on the surface. Next, plasma that contains oxygen (O<sub>2</sub>) is irradiated onto the surface, causing the reactive sites to react with the O<sub>2</sub>. By this method, it becomes possible to introduce chemically stable superhydrophilic functional groups such as carboxyl groups or hydroxyl groups to the DLC surface, and to fix drug-containing bioabsorbable polymers evenly and firmly to the DLC surface.

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