

PO1100

Surface activation of structured organic plasma deposits: from superhydrophobic to superhydrophilicJohannes Berndt¹, Eva Kovacevic¹, Hamid Acid¹, Laifa Boufendi¹¹GREMI, Orléans, France

johannes.berndt@univ-orleans.fr

The wettability of surfaces is a decisive factor for many applications. The control of the wettability is for example crucial for the production of antifouling coatings or for lab on a chip applications.

The controlled production and deposition of nanoparticles in a low temperature plasma (capacitively coupled discharge) was used in this contribution to deposit films with variable porosity. The precursors used in the experiments included simple materials like acetylene or methane or more complex ones like MMA. Depending on the deposition conditions and the density of nanoparticles used for the deposition it is possible to produce surfaces with static contact angles of about 160° and roll off angles smaller than 5 degrees. A proper post-treatment of these surfaces by means of nitrogen containing plasmas, energetic ions or photons can be used to change the wettability again and to produce patterned surfaces with superhydrophobic and superhydrophilic substructures. The effects of the posttreatment on the material properties were analyzed by means of Fourier transformed infrared spectroscopy, high resolution XPS and Near-Edge X-ray Absorption Fine Structure spectroscopy (NEXAFS).

Keywords

nanoparticles
patterned surfaces
wettability
post-treatment
NEXAFS