

PO4059

Deposition of superhydrophobic structures by magnetron discharge

Stéphane Lucas¹, Alexandre Felten¹, JP Blondeau², Fabrizio Maseri³, JJ Pireaux¹,
Valérie De Vriendt¹

¹University of Namur (FUNDP) - PMR, Namur, Belgium ²Université d'Orléans - LESI, Chartres, Belgium ³Arcelor Mittal Research & Development, Liège, Belgium

stephane.lucas@fundp.ac.be

The present study demonstrates the creation of superhydrophobic surface with a high water contact angle (CA) of 155° and low CA hysteresis (3°). The surface is covered with amazing microstructures in the shape of flower. These structures were confirmed to be fractal by box-counting measurements, and are obtained by pulsed magnetron discharge from acetylene. This technique is attractive because it's simple, effective, environmentally friendly and applicable to any industrial processes involving large flat substrates like in steel and glass coating industries. This work shows also the importance of the surface density of fractal structures for the fabrication of superhydrophobic surfaces. Indeed, we observed that to have a high water CA (> 150°), the number of fractal structures per cm² on a given surface must to be as high as possible. If this number decreases thus the fluor treatment of fractal surfaces is necessary to obtain superhydrophobic films.

Keywords

Nano-structures

Hydrophobic

Plasma