

Seminář odd. 26

Tenkých vrstev a nanostruktur

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TÉMA

Cold atmospheric plasmas for material synthesis and surface treatment

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Cold atmospheric plasmas (CAPs) are increasingly studied for their potential application in many applications such as generation of reactive species, water treatment, medical applications, or even material synthesis. These plasmas are in non-equilibrium, where only electrons are effectively heated and the heavy particles stay cold, close to the room temperature. They are operated under ambient pressure and temperature in air or selected gas mixtures and they are composed of charged particles (electrons, positive and negative ions), radicals, neutral species (excited atoms and molecules), photons (visible and UV) and electromagnetic fields. With their low temperature, CAPs have the ability to generate high densities of reactive oxygen species (ROS) and reactive nitrogen species (RNS) without heating significantly the gas mixture. On the contrary, the small nanoparticles in the plasma can be selectively heated through recombination reactions on their surface, which leads to their crystallization. CAP are used and their potential investigated in many applications such as thin film deposition and etching, synthesis of nanoparticles, spectroscopy, water treatment, or even medical applications such as skin treatment. The brief summary of activities in the field of diagnostics and applications of CAPs at the Ruhr-University Bochum will be presented.

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