

Particle Surface Modification in the Plasma of an RF Discharge

Kononov E A^{1,2,®}, Vasiliev M M^{1,2} and Petrov O F^{1,2}

¹ Joint Institute for High Temperatures of the Russian Academy of Sciences, Izhorskaya 13 Bldg 2, Moscow 125412, Russia

² Moscow Institute of Physics and Technology, Institutskiy Pereulok 9, Dolgoprudny, Moscow Region 141701, Russia

® GADvin@yandex.ru

Plasmas containing microparticles are often found in nature—in space, in technological processes [1]. Particles in plasma significantly affect its properties (charge distribution, fields). In turn, the plasma interacts with objects in contact with it—parts of the experimental setup (electrodes, walls of the working chamber), dust particles in it, changing the properties of the latter.

The results of an experimental study of the composition and surface structure of polymer particles and particles with a metal shell during their exposure in the plasma of a capacitive radio-frequency discharge are presented [2]. When the particles were kept in the Coulomb system, metals were deposited on their surface, and the change in the elemental composition of the surface was nonlinear in time. A metallic island film was formed on the surface of polymer particles, from which a continuous coating can form over time. This modification leads to the acquisition by the particles of unique functional properties of the surface and composition, which can be used for scientific purposes [3] (creation of active Janus particles for studying self-organization in colloidal systems).

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