SURFACE MODIFICATION OF FLEXIBLE POLYURETHANE IMPLANTS BY BIOCOMPATIBLE COATINGS OBTAINED BY PVD WITH ASSISTING RF FIELD AT LOW SUBSTRATE TEMPERATURE

I. E. Garkusha[a], V. S. Taran[a], R. M. Muratov[a], A. V. Taran[a], A. V. Leonovych[a], M. S. Sergiiets[a], I. F. Mihaylov[b], A. A. Baturin[b], G. P. Nikolaychuk[b]

[a] *Institute of Plasma Physics, NSC "Kharkiv Institute of Physics and Technology", 61108, Kharkov, Ukraine*
[b] *National Technical University (Kharkov Polytechnical Institute), Kharkov, Ukraine*

Thin Zr and Ti coatings (70 nm thick) have been obtained by vacuum-arc deposition with assisting RF-field on polyurethane surfaces (PUR) at low substrate temperature (60°C). The choice of Ti and Zr coatings on PUR is based on the idea of combining the properties of the polymer (e.g., elasticity, vessel-like) with those of a thin metal-coating (e.g., biocompatibility, corrosion, and degradation resistance). The surface morphology, structure, elemental and phase composition of the obtained coatings was examined by SEM, TEM, XRF. It was revealed that vacuum-arc method with RF-field allowed applying coatings on PUR flexible surfaces at (60°C, decreasing the formation of macro-particles, providing formation of α-Zr and α-Ti polycrystalline films of hexagonal modification with average grain size of 0.1 μm. The roughness of the obtained coatings has been measured.

INVESTIGATION OF THE METHOD OF DYNAMIC MICROWAVE POWER REDISTRIBUTION IN A RESONATOR-TYPE PLASMATRON

S. Madveika, S. Bordusau, A. Zemlyakov, M. Lushakova

Belarusian State University of Informatics and Radioelectronics, P.Brovki 6, 220013 Minsk, Belarus

The investigation results of a dynamic microwave power $f_{microwave} = 2.45 \pm 0.05\,\mathrm{GHz}$ redistribution in a $9\,000\,\mathrm{cm}^3$ reaction-discharge chamber of a microwave resonator-type plasmatron are presented. In order to redistribute the microwave power, a rotating metallic four-blade L-form dissector placed above the reaction-discharge chamber was used. The microwave power in the local points at the axis of the chamber with plasma and without it was measured applying the "active probe" method. During the experiments the chamber contained silicon plates. Periodical interchange of maximum and minimum microwave power values along the chamber axis was established experimentally. Note, when the dissector was rotating, the range of maximum and minimum "active probe" values dispersion decreased. It has been established that during the dissector rotation the microwave power in the local discharge areas changes with periodic repetition every quarter of revolution.
Keywords: microwave plasma, microwave power, redistribution, dissector.

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DEVELOPING AIR QUALITY IMPROVEMENT SYSTEM OF A SWINE HOUSE USING PLASMA SYSTEM

S. Arunrungrusmi[a], P. Chansri[a], N. Mungkung[a], T. Yuji[b]

[a] *Plasma and Electrical Discharge Lab, King Mongkut's University of Technology Thonburi, Thailand*
[b] *Faculty of Education, University of Miyazaki, Japan*

The study was set to develop an air purification system for a swine house. This system was used to sterilize disease and improving the air quality inside and outside the swine house. The plasma with oxygen was mixed to produce the ozone gas with raging 4 - 10 ppm that active for the sterilize performance. The vacancy time is reduced from 7 days to 4 days. This show that 42 percent was reduced in this system The weight of pigs increased from 100 kilograms per one pig to 104 kilograms, rising by 4 percent. Pig house It was found to be more satisfying compared to pre-installed plasma systems for disinfection and improved air quality.