

## THE SYSTEM OF PLASMA-ASSISTED RF - APPLYING COATINGS FROM POWDER DIELECTRIC MATERIALS\*

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This paper presents the results of the development and study of the system of plasma-assisted RF application of dielectric coatings from powder materials. The system (Fig. 1) consists of a target with a diameter of 200 mm with a powder material from which covers and a gas plasma generator "Pink" are applied. The system reduces the coating pressure to significantly increase the coating rate and allows you to control the properties of the coatings of the plasma assistance during the deposition process. Studies were carried out at the installation of electron-ion-plasma engineering of the complex surface "Complex" developed in the laboratory of plasma emission electronics IHCE SB RAS.

The operating modes of the system were investigated and the dependence of the ion current density was removed on the samples from the power of the RF discharge in the Ar and Ar + N<sub>2</sub> atmosphere. All data were removed for 7 values of the current of the discharge of the plasma generator  $I_p = 5, 10, 15, 20, 30, 40, 50$  A. for these values, the dependences of the current density from the RF power and the discharge voltage from the RF power were constructed.

Trial processes of deposition of the coating AlMgB<sub>14</sub> (BAM) were carried out. Substrates - Samples (VK8 alloy and steel R6M5) were pre-cleaned in an ultrasonic bath, were fixed on the substrate and placed in the chamber. The second phase of purification was purified in the gas discharge of the plasma generator for 15 minutes at a current of discharge 30 A, the displacement supplied to the samples was -990 V, with a duty of 75%. After cleaning, the samples unfolded to the target attached to the RF-current, AlMgB composition. The inclusion of the RF of the generator and the matching device was filled with 300 W power to warm up the target and its expansion. When pressure is set, the power rises to 700 W, so that the discharge burning voltage was about 1 kV. The displacement for samples was established about 100 V with a duty capacity of 50%. The process adjustment was carried out by changing the reflected RF power and flow current of the plasma generator.

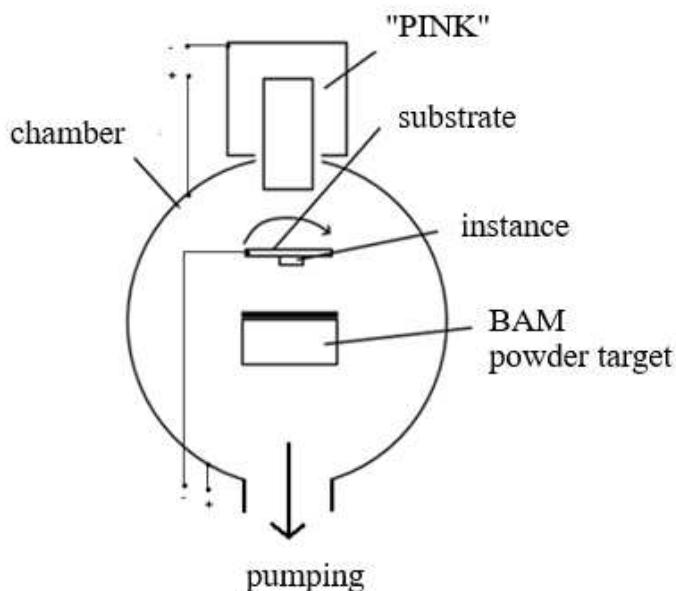


Fig.1. Scheme of experiment.

BAM coatings with a thickness of up to 3  $\mu\text{m}$  were obtained with a precipitation rate of  $\sim 1.3 \mu\text{m} / \text{hour}$ .

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