FORMATION OF COATINGS PRODUCED USING A COLLOID SOLUTION OF NANOSTRUCTURED CARBON [[1]](#footnote-1)\*)

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Recently, much attention has been paid to increasing the emissions of carbon-like (diamond-like carbons, DLC) coatings and films for solving wide applied spectral problems, in particular, in medicine, radio engineering, in the production of scattering coatings by the plasma-chemical method, etc. [1]. One of the problems that arise in the preparation of DLC screens is to achieve a high degree of uniformity and adhesion at a thickness of ~1 μm.

In the proposed work, a diamond-like carbon coating was obtained by evaporating a colloidal solution of nanostructured carbon in ethanol on a solid surface. The preparation procedure is described in detail in [2]. The colloidal solution was amorphous carbon (disordered graphite) with a characteristic particle size from 4 nm to 40 nm.

Preliminary experimental results on the formation of diamond-like coatings upon activation of the initial surface by UV radiation at a wavelength of 253.7 nm and upon heating to 55°C demonstrate the possibility of increasing the uniformity of coatings and their adhesion.

The experiment was as follows: a colloidal solution of nanocarbon in ethanol was applied to a microscope slide. After the evaporation of ethanol, “islands” of a thin (<< 1 µm) carbon film formed on the glass surface. By activating the surface with UV radiation and by stimulating the process of ethanol evaporation of the colloidal solution, on the whole, it was possible to increase the uniformity of the “island” coating and its adhesion.

The contact angle was measured using an FTA1000 Drop Shape Instrument B Frame System. The test sample was placed on a horizontal holder. To avoid errors caused by the distortion of the droplet shape under the action of gravity, the liquid was applied to the surface of the test sample using a special microdosing syringe. The volume of drops was 100 μl.

References

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLIX/Pt/ru/HC-Moryakov.docx) [↑](#footnote-ref-1)