

SYNTHESIS OF MULTILAYERED COATINGS BY VACUUM-ARC PLASMA-ASSISTED METHOD*

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The vacuum-arc synthesis of PVD coatings with multilayer structure has been described. Few methods have been considered. There are gas changing, the use of few arc evaporators with substrate holder rotating, the use of gas plasma generator, and etc. The feature of new low-inertia deposition method is the use of a gas plasma source based on a non-self-sustained arc discharge with thermionic and hollow cathodes. The coatings were synthesized by the vacuum-arc method in a QUINTA automated ion-plasma set-up (IHCE, Tomsk, Russia). Its description is detailed elsewhere [1]. The examples of multilayered coatings deposited by low-inertia method are presented. The systems of multilayer coating were based on Mo, Nb, Zr, Al, Ti and their nitrides. The properties, structure, elemental and phase compositions were detailed investigated. The thickness of one layer of multilayered coatings varied in the range of few to hundreds nanometers. It is shown that selected method characterized by low inertia, which would make it possible to achieve a high reproducibility of the composition and thickness of multi-layer coatings, which would naturally improve their functional properties.

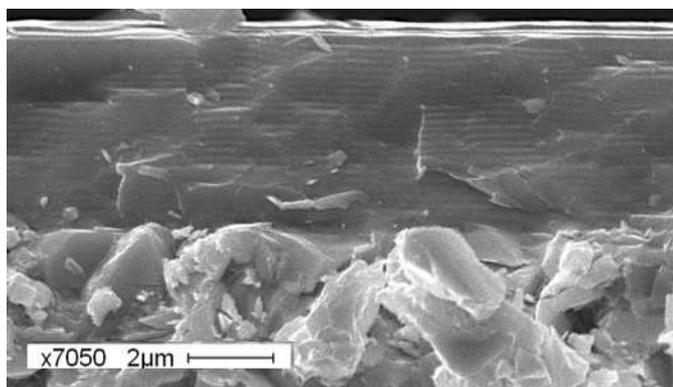


Fig.1. Typical SEM image of multilayered coatings with the 100-nm thickness of layer.

REFERENCES

- [1] V.V. Shugurov, N.N. Koval, O.V. Krysina, N.A. Prokopenko, "QUINTA equipment for ion-plasma modification of materials and products surface and vacuum arc plasma-assisted deposition of coatings," IOP Conf. Ser.: J. Phys.: Conf. Ser., vol. 1393, pp. 12131 (1–10), 2019.

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