

FORMATION AND PROPERTIES OF MULTILAYER FILMS OF HIGH-ENTROPY ALLOYS BY ION-PLASMA METHODS*

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Comparative experiments were carried out on the formation of films of high-entropy alloys (HEA) by vacuum deposition with simultaneous independent evaporation of cathodes of several elements, as well as vacuum-arc evaporation using a multicomponent cathode (Fig. 1). It is shown that varying the discharge current of electric-arc evaporators during the formation of HEA from several cathodes makes it possible to change the elemental composition of HEA films over a wide range. It has been established that the formed films are single-phase materials with a nanocrystalline structure. The microhardness of the films depends on the concentration of chemical elements.

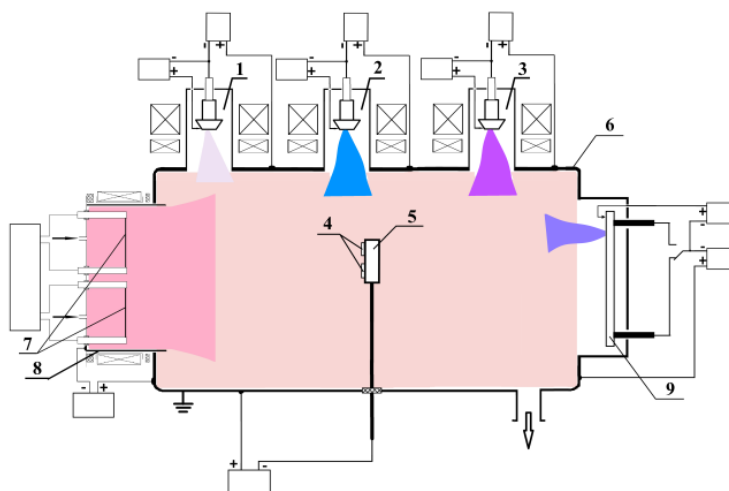


Fig.1. Scheme of the experiment for obtaining HEA films.

The samples of HEA films for X-ray phase analysis (XPA) were studied using the synchrotron radiation of the VEPP-3 electron storage ring as part of the Center for Collective Use of the SCST on the basis of the UNU "VEPP-4 Complex - VEPP-2000" at the Institute of Nuclear Physics of the Siberian Branch of the Russian Academy of Sciences. The phase composition and parameters of the crystal structure are revealed.

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