

MAGNETRON SPUTTERING WITH A HEATED BORON TARGET *

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Interest in obtaining boron-based coatings is determined by the prospects of their use for goals of modifying the surface properties of a wide range of parts and equipment. Boron-based coatings potentially have high resistant to mechanical wear, corrosion, significant thermal stability, and a low friction coefficient. In this work, we consider the equipment for the implementation of plasma method for the deposition of thin boron-based films on the surface. This is a magnetron sputtering with a crystalline boron target heated in the discharge. The design, the principle of operation, and the characteristics of a planar magnetron sputter with pure boron target are presented. A feature of this device is the use of a thermally insulated target (cathode) made from pure crystalline boron, which was heated to provide electrical conductivity sufficient for the stable functioning of the magnetron discharge, by an auxiliary low-current discharge. This makes it possible to realize in the magnetron a DC mode as well as a pulsed self-sputtering mode, in which boron ions in the discharge plasma dominate over the ions of the working gas. The properties of the resulting boron-based coatings have been measured and discussed.

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