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Ratio of ionic and atomic components in process of boron coating by magnetron sputtering and electron-beam evaporation

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A method for experimental estimation of the ratio of ionic and atomic components in the process of coating formation by magnetron sputtering and electron-beam evaporation is proposed. The method is based on a comparative analysis of the weight increment of original condensation probe substrates with and without a transverse magnetic field. It was found that during electron-beam evaporation, the ionic component makes the decisive contribution to the formation of the coating, while during magnetron sputtering, the atomic one. Based on the evaluation of each of these contributions, the ratio of the concentrations of the atomic and ionized components of boron in the plasma of the electron beam and in the plasma of the magnetron discharge was determined.

Keywords: magnetron sputtering, electron beam evaporation, boron films, condensation probe, measurement of plasma parameters.

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