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THE CONCENTRATION OF ELECTRONS IN THE ONE-CHANNEL ATMOSPHERIC PRESSURE GLOW DISCHARGE PLASMA TO THE SURFACE OF DISTILLED WATER

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Abstract

The discharge current dependences of the specific electrical power of the glow-discharge above the distilled water surface, the cathode spot area and area of cross-section of positive column has been investigated. For currents up to 32 mA, the discharge exists in the form of a single homogeneous channel. When the current is increased to increase in the cross-section of positive column to 22 mm² was observed. The cathode spot area decreases from 14 (I = 10 mA) to 9.5 mm² (I = 17-32 mA). At the current increasing from 12 to 32 mA the electric power of discharge was increased linearly from 15 to 32 W. The maximum value of the average volumetric density of electric discharge power is achieved at a current of 32 mA and consist of 0,35 W/mm³. Increasing of

current from 12 to 16 mA give decreasing of discharge volume from 73 to 65 mm³

, and the current rise from 22 to 32 mA linearly increases discharge volume from 65 to 80 mm³

. The maximum value of electron concentration was estimated in the cathode spot area and in positive column at 10–32 mA current. The electron concentration consists up to n

e
 $= 10$
 13

cm⁻³

in the cathode spot. In positive column it consists less then 2×10^{11}

cm⁻³

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References 11, figures 3.

Key words: concentration of electrons, glow-discharge, distilled water, specific electrical power of the glow-discharge, the cathode spot area, area of cross-section of positive column.

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