Investigation of the effect of the electrochemical properties of the solution on the luminescence intensity of molecular nitrogen in a discharge with a liquid cathode

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For the discharge with the liquid cathode near the solution surface, the dependence of the radiation intensity of the second positive molecular nitrogen system on the discharge current at different conductivity and pH of the solution is found. It is shown that the radiation intensity of the second positive nitrogen system increases with a decrease in the conductivity and a decrease in the pH of the solution. For the discharge with the liquid cathode, the distributions of the luminescence intensity of the second positive system of molecular nitrogen in height are found for different electrochemical properties of the liquid cathode. It is shown that in all cases the intensity distribution over the height has two maxima. One near the metal anode, the other near the liquid cathode. Moreover, the maximum near the metal anode is approximately an order of magnitude higher in intensity than the maximum near the surface of the liquid cathode. It is shown that the vibrational and rotational temperatures determined from molecular nitrogen near the metal anode and liquid cathode do not depend on the electrochemical properties of the liquid cathode. The vibrational temperature near both electrodes was 3800 K. The rotational temperature near the metal anode was 1150 K, near the liquid cathode 2400 K.

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