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The book contains abstarcts of oral and poster reports presented at the 14th International Conference "Gas Discharge Plasmas and Their Applications" (GDP 2019). This event is a continuation of conferences on gas discharge physics held in Russia since 1984, as well as seminars and conferences on the technological application of low-temperature plasma. The conference is held every 2 years in different cities of the Russian Federation. This year, the wonderful Siberian city of Tomsk, known for its intellectual environment, was chosen as the venue. The program of the Conference covers a wide range of technical areas and modern aspects of the physical processes occurring in generators of low-temperature plasma, low and high-pressure discharges, pulsed plasma sources, surface modification, and other gas-discharge technologies.

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SOME FEATURES OF THE ELECTRIC DISCHARGE WITH THE ANODE AS A LIQUID ELECTROLYTE FLOW*

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Electric discharge between a liquid electrolyte anode and a metal cathode was experimentally investigated. Sodium chloride solutions in distilled water were used as electrolyte.

The aim of the work was to study the properties of electric discharge with liquid electrolyte anode at elevated currents. The study was conducted in the range of currents of 0.1-3.5 A. Electric power was supplied from a three-phase rectifier through a C-L-C filter.

Electric discharge was created with use of various embodiments of electrode assemblies.

In one embodiment, the body *1* of anode assembly was made of a dielectric material in the form of an elongated hollow body (fig.1). Inside the cavity was mounted metal electrode *2* from a palladium-tungsten alloy. The electrolyte flowed out of a narrow slot *3*, made on the housing *1*. The tubular metal cathode *4* was located coaxially with the anode housing in different positions: with horizontal displacement ($x \neq 0$) and without displacement ($x = 0$). The displacement of electrodes relative to each other contributed to the formation of a voluminous plasma *5*. As can be seen from the oscillograms *6*, presented, during the burning of the discharge, current and voltage pulsations occurred.

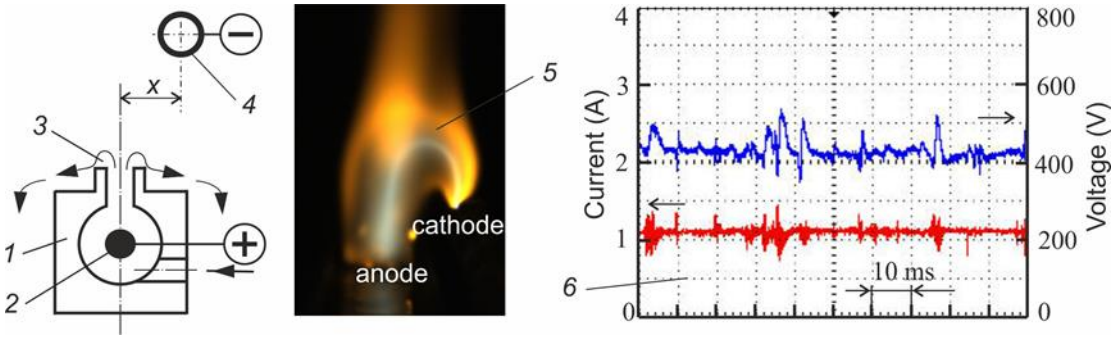

Fig. 1. Diagram of discharge assembly, photo of discharge, oscillogram of current and voltage. x = 14 mm. The molar concentration of an aqueous solution is 0.1 mol/l. Instant photo taken with exposure 0.2 ms.

In this case the peculiarities of electrical discharge which were shown with an increase in current and an increase in the interelectrode distance vertically were found, and also when the concentration of the aqueous solution was changing - an anode.

With an increase current in the discharge gap, a contracted channel was formed. It is noteworthy that contracted channel adjoined liquid anode without changing the brightness of the glow.

On the high-speed video frames contracted channel was in a single copy. With increasing discharge current channel was expanded. Spectral studies have shown that the radiation spectrum contains intense Balmer hydrogen lines. It can be noted that discharge radiation has common features with the emission of a plasma column near metal cathode in the water flow [1].

Increasing distance between electrodes was led to disruption of spatial stability of the plasma column. The physical picture of the phenomena was almost the same when using aqueous solutions with different concentrations.

REFERENCES

[1] *Tazmeev G.K., Timerkaev B.A., Tazmeev K.K. //* Plasma Physics Reports. – 2017. – V. 43. – № 7. P. 771-777.

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