The analysis of electrical characteristics of the discharge with the liquid cathode with organic impurities

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The electrical characteristics of the discharge with the liquid cathode are studied. The role of the liquid cathode was performed by an aqueous solution with organic impurities. Various alcohols were used as organic impurities. The study was carried out for discharge chambers with different free surface areas of the liquid and different modes of mixing the solution near the liquid surface. In the discharge channel of the discharge with a liquid cathode, in the presence of various alcohols in the solution, the values of the field strength were determined. For this purpose, in each case, the dependence of the voltage drop on the discharge cell on the distance between the electrode and the solution surface at a given discharge current was constructed. Since this dependence is close to linear, the field strength in the discharge channel of the liquid cathode discharge was determined as the tangent of the angle of inclination of this line. It is established that the field strength within the error of determination does not depend on the presence and type of alcohol in the solution (at a concentration of up to 1% of alcohol by volume), as well as on the free surface area of the liquid in the discharge chamber, but depends on the mixing mode of the solution near the liquid surface. It is shown that the field strength in the discharge chamber (in the mode without mixing the solution) in all cases is 2.2-2.3 times higher than the field strength in the open air under the same conditions.

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