

Investigation of non-stationary processes on the cathode surface in a discharge with a liquid cathode

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The methods of high-speed photo and video recording were used to study the dynamics and shapes of cathode spots, the processes of their appearance and disappearance on the surface of a liquid cathode. In the course of the study, it was found that cathode spots on the surface of solutions have a complex tree-like shape. Moreover, this form depends both on the composition and electrochemical properties of the solution, and on the discharge current.

It was found that the brightness of cathode spots depends significantly on the composition and electrochemical properties of the solution. The brightest cathode spots are observed on the surface of a sodium hydroxide solution (alkaline medium). Less bright cathode spots on the surface of a nitric acid solution (acidic environment). On the surface of a sodium nitrate solution (neutral medium), the brightness of cathode spots is the lowest.

For solutions of sodium hydroxide and nitric acid, the dependence of the brightness of cathode spots on the solutions surface from the discharge current was found. It was found that the brightness of the cathode spots for both solutions decreases with increasing discharge current in the current range from 20 to 80 mA.