

# Investigation of the dependence of the structure of the discharge channel in a discharge with a liquid cathode from the electrochemical properties of a liquid cathode

**Yakushin R V<sup>1,®</sup> and Chistolinov A V<sup>2</sup>**

<sup>1</sup> Mendeleev University of Chemical Technology of Russia, Miusskaya Square 9, Moscow 125047, Russia

<sup>2</sup> Joint Institute for High Temperatures of the Russian Academy of Sciences, Izhorskaya 13 Bldg 2, Moscow 125412, Russia

® yakushinrv@yandex.ru

In the discharge with the liquid cathode, the discharge channel near the surface of the liquid cathode is divided into separate filaments. In this case, the filaments near the surface of the liquid cathode are in constant chaotic motion. Not only does their position in space and the size of the area they occupy change over time, but also their number. The influence of the specific electrical conductivity and pH of the solution on the position of the branch point of the discharge channel on individual filaments, the diameter of the filamentation zone near the surface of the solution, and the number of filaments in the liquid cathode discharge is studied. It is shown that as the specific electrical conductivity of the solution increases, the height of the filamentation zone, the diameter of the filamentation zone near the solution surface, and the average number of filaments fall. It is shown that for the same specific electrical conductivity of the solution, the maximum height of the filamentation zone, the minimum diameter of the filamentation zone, and the minimum average number of filaments are observed at a pH of the solution close to neutral.

This work was partially supported by the Russian Foundation for Basic Research grant No. 20-08-00898.