

Investigation of the spatial distribution of the emission intensities of various components of plasma in a direct current discharge with a liquid cathode

Perfileeva A V², Chistolinov A V^{1,®} and Lubin A A^{1,2}

¹ Joint Institute for High Temperatures of the Russian Academy of Sciences, Izhorskaya 13 Bldg 2, Moscow 125412, Russia

² Mendeleev University of Chemical Technology of Russia, Miusskaya Square 9, Moscow 125047, Russia

® a-chi@yandex.ru

The purpose of this project was to experimentally study the spatial distribution of plasma parameters in a direct current discharge with a liquid cathode for different compositions and electrochemical properties of liquid cathodes, for which various aqueous electrolyte solutions were used.

The vibrational and rotational temperatures are determined for molecular nitrogen in different parts of the discharge channel of a discharge with a liquid cathode at different discharge currents and electrochemical properties of the liquid cathode.

Spatial profiles of the emission intensities of various components of the discharge plasma with a liquid cathode along the discharge axis were constructed for different compositions and electrochemical properties of the liquid cathode. It has been established that for all components of the discharge plasma with a liquid cathode, there is a dependence of the spatial profile of the emission intensity on the composition and electrochemical properties of the liquid cathode. It is shown that in all cases this dependence manifests itself most strongly near the surface of the liquid cathode.