

**SMOOTH DECREASE OF SPECTRAL SERIES LINES
INTENSITY WHEN APPROACHING THE IONIZATION
THRESHOLD IN A DENSE EQUILIBRIUM PLASMA.
PART II. EXPERIMENT**

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The report presents the results of a study of low-temperature, singly ionized atmospheric pressure helium plasma using optical emission spectroscopy methods [1,2]. The difficulties in studying such plasma are related to the high ionization potential of helium (24.59 eV), which, in combination with the small weight of its atoms and, as a consequence, large transfer coefficients, makes such plasma difficult to produce [3]. A direct current arc plasma torch was used as a plasma source, the current strength could vary from 200 to 400 A. The electron concentration, determined by the Stark broadening of spectral lines, was $8.6\text{--}9.3\cdot 10^{16}\text{ cm}^{-3}$. Determining the electron temperature, despite the obvious equilibrium of such plasma, turns out to be non-trivial [2]. This is due to the fact that non-ideality effects are clearly evident in plasma [1], leading to a faster decrease in the intensities of spectral lines when approaching the ionization threshold, which leads to underestimated values of the electron temperature.

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1. Korshunov O. V., Chinnov V. F., Kavyrshin D. I. // High Temp. — 2019. — V. 57. — P. 147-155.
 2. Korshunov O. V., Chinnov V. F., Kavyrshin D. I. // High Temp. — 2019. — V. 57. — P. 308-315.
 3. Spitzer L. Physics of Fully Ionized Gases: Second Revised Edition. New York: Dover Publications, 2006.