CHEMILUMINESCENT RADIATION OF A STATIONARY ELECTRODISCHARGE PLASMA OF LOW PRESSURE ON VAPOUR MIXTURES OF WATER WITH HELIUM

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S u m m a r y

The results of investigation of the radiation of a plasma glow discharge constant current on mixtures He/ H_2O = 0.5 ÷ 8.0/ 0.05 ÷ 0.15 kPa in a spectral range 130 ¯ 350 nm are presented. We show that, at $P(H_2O)$ = 0.05 ÷ 0.15 kPa and $P(He)$ = 1.0 kPa, the plasma is a source of VUV radiation in the range 130 ¯ 190 nm with maxima at 157, 180, and 186 nm. The increase of the partial pressure of water vapour to 2.0 ¯ 2.5 kPa led to a decrease of the brightness of VUV radiation by 1 ¯ 2 orders, and the band $\Delta\lambda$ = 307.0 − 315.0 nm with λ_{max} = 309.6 nm becomes main in the spectrum, the appearance of which could be cause by the radiation decay of cluster molecules ¯ $(OH)^*_n \cdot (H_2O)_m$ (where: $n \geq 2$ and $m \geq 1$). The optimization of brightness of the radiation of the plasma depending on pressure, composition of the mixture, and size of a discharge current was conducted. The mixture He/ H_2O with a low content of water vapour could find its application in the development of an ecologically pure radiator of continuous operation in the range of vacuum ultraviolet.