UV – VUV SOURCE OF RADIATION ON THE BASIS OF CHLORINE MOLECULES AND KRYPTON CHLORIDES WITH PUMPING IN THE PLASMA OF A NEGATIVE CATHODE GLOW

A. K. Shuaibov, A. I. Dashchenko, I. V. Shevera

Uzhgorod National University
(46, Pidhirna Str., Uzhgorod 88000, Ukraine)

S u m m a r y

The results of investigation of the formation of molecules Cl_2^* and KrCl (B) in an open-air cage discharge of low pressure on mixtures He/Cl_2 and Kr/Cl_2 are presented. Optimization of the plasma radiation of an extended negative cathode glow in the spectral range 150 – 350 nm is conducted. It is established that the open-air cage discharge on the mixtures of inert gases with molecules of chlorine is a rather efficient source of continuous radiation with maxima at $\lambda = 195 \div 200$ nm (Cl_2^*), 222 nm [$KrCl(B - X)$], and 258 nm [$Cl_2 (D' - A')$]. The most optimal working media are $P(He)/P(Cl_2) = (1200 \div 1500)/(300 \div 400)$ Pa and $P(Kr)/P(Cl_2) = (500 \div 700)/(200 \div 270)$ Pa. The full power of UV-VUV radiation reaches 10 – 12 W at an effeciency (J) of 10%. The obtained results can be used in the development of a high-power UV-VUV lamp, perspective for a pumping of working media of lasers or quantum amplifiers, disinfecting a drinking water, photolysis of ozone from oxygen, and for a number of other applications in microelectronics, ecology, and medicine.