PULSED-PERIODIC VOLUME DISCHARGE IN MIXTURES OF ATOMS Ar, Kr AND Xe WITH MOLECULES Cl_2

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S u m m a r y

The results of investigation of space, electric, and optical characteristics of volume discharge at low pressure in mixtures Ar/Cl_2, Kr/Cl_2, and Xe/Cl_2 in the electrode system 'spherical anode-plane cathode“ are presented. It is determined that under the pressure of inert gases $P \leq 2.0$ kPa, partial chlorine pressure of 0.04– 0.40 kPa, and on connecting the discharge gap with the source of constant voltage ($U_{ch} \leq 1$ kV), the pulsed discharge with the repetition frequency of pulses $f = 0.1 \div 120$ kHz (mixtures Ar/Cl_2; Kr/Cl_2) or pulsed discharge with continuous current component (mixture Xe/Cl_2) was ignited. At the expense of development of an unstability in low-density electronegative plasma, a domen with an average diameter of 2 – 40 mm was formed. It is determined that the plasma of a domen was a pulsed-periodic sourc of wideband radiation of molecules $ArCl(B - X)$, $KrCl(B - X)$, $XeCl(B - X; D - X)$, $Cl_2(D' - A')$ in a spectral range 170 – 340 nm. The optimization of brightness of UV– VUV plasma radiation as a function of pressure, gas mixture composition, and average discharge current is carried out. The temporal characteristics of the pulsed component of the voltage on the discharge gap, discharge current, and total radiation of plasma in a spectral range 200 – 700 nm have been investigated. The volume discharge not bounded by dielectric walls can be used for a design of planar and cylinder excimer-halogen pulsed periodic lamps of low pressure.