TRANSVERSAL RADIO-FREQUENCY DISCHARGE IN THE Xe/Cl_2 MIXTURE

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S u m m a r y

Results of investigation of a transversal radio-frequency (rf) ($f = 1.76$ MHz) discharge (TRFD) in the Xe/Cl_2 gas mixture (the gas pressure $P \leq 400$ Pa) are presented. It is shown that the discharge is a high-power wide-band source of uv radiation in the spectral region of 220—450 nm defined by the wide bands of $XeCl(D-X, B-X; B-A, C-A)$ possessing the maxima at, correspondingly, λ = 236, 307, 390, and 430 nm, and the 257-nm band of $Cl_2(D' - A')$. A unified continuum in the spectral region of (220—310) nm has been formed on the basis of the bands of $XeCl(D, B - X)$ and $Cl_2(D' - A')$, as a result of the incompleteness of vibrational relaxation, whereas the bands of $XeCl(B, C - A)$ have formed a less intensive continuum in the region of 320—450 nm. The plasma emission was composed of an rf component and a dc component. A 8-ms macropulse has been formed as a result of discharge initiated by applying a pulsed voltage "filled" with the rf oscillations. Mixtures of $P(Xe)/P(Cl_2) = (400 \div 200/40 \div 30)$ turned out to be optimal for achievement of maximal uv-emission power. Average uv-emission power of the whole working aperture has reached 30—50 W at an efficiency of 10—15%.