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Modeling of the DBD in Xe-Cl_2 mixtures: effect of chlorine concentration and pressure SVETLANA AVTAEVA[1], Kyrgyz-Russian Slavic University, Bishkek, Kyrgyzstan, BELKACEM SAGHI[2], BOUABDELLAH RAHMANI, Mohamed Boudiaf University of Science and Technology, Oran, Algeria — Characteristics of the DBD in Xe-Cl_2 mixtures were simulated using the 1D fluid model at gas pressure 150-300 Tor and chlorine concentration in the mixtures 0.1-5%. The discharge gap is fixed at 4 mm. Two dielectric layers have an identical thickness 2 mm and relative permittivity 4. The source voltage $U_S = U_0 sin\omega t$ with f=100 kHz and U_0=4.25 or 5 kV is applied to the electrodes. Simulations show at all chlorine concentrations in the Xe-Cl_2 mixtures the most abundant negative species in the discharge are Cl^- ions, the most abundant positive ions are Xe_2^+. At the current pulse densities of electrons and Xe^+ ions near the dielectric barrier sharply increases. The potential drop across the discharge gap increases and the magnitude of the current pulse falls with chlorine content in the mixture. Power deposited into heating of positive and negative ions grows with chlorine concentration; power deposited into electrons mainly decreases with chlorine concentration. Growth of the chlorine content in Xe-Cl_2 mixtures results in increase of electron energy expenses on Cl_2 dissociation, Xe and Cl_2 ionization, and Cl_2^* and Xe^{**} excitation. At chlorine concentration higher than 0.1% emission of the $XeCl^*$ 308 nm band predominates in radiation flux. The DBD radiative efficiency decreases with pressure and has maximum at small chlorine concentration.

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