Model of plasma of glow discharge in neon at cryogenic temperature

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A model of a plasma of a glow discharge in neon at a cryogenic temperature was developed, taking into account the temperature dependence of the rate constant of chemionization, as well as the formation of molecular ions. The discharge plasma was described in the diffusion-drift approximation. The value of the rate constant of chemionization at a temperature of 77 K was varied with the aim to fit with the experimental data on the pressure dependence of the reduced electric field. The obtained value of the chemiionization rate constant is consistent with the theoretical models available in the literature, however, as far as we know, it has not been previously obtained from the experiment directly or indirectly.
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