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Normal regime of dc discharge in N_2O VALERIY LISOVSKIY[1], EKATERINA ARTUSHENKO, VLADIMIR YEGORENKOV, Kharkov National University, Svobody Sq.4, Kharkov 61022, Ukraine — The present report is devoted to studying the normal regime of dc discharge in N_2O with the inter-electrode distance values $L = 0.5$, 1 and 2 cm in a broad range of gas pressure. At large N_2O pressure the ratio of the normal current density to gas pressure squared was shown to remain constant and to equal $J_n/p^2 = 0.44 \pm 0.03$ mA/(cm·Torr)^2 for any inter-electrode distance value (within the L range we studied). On decreasing N_2O pressure the J_n/p^2 ratio grows and for narrow inter-electrode distance it may approach some or even some tens of mA/(cm·Torr)^2. For $L = 2$ cm the normal regime is observed only at the N_2O pressure values above the inflection point on the dc breakdown curve for this inter-electrode distance ($pL \geq 0.6$ Torr·cm). But for narrow distance values $L = 0.5$ and 1 cm the normal regime may exist in a much broader N_2O pressure range to the right as well as to the left of the dc breakdown curve minimum. Its existence region is limited from the low pressure side only by the appearance of the obstructed regime at the left-hand branch of the breakdown curve when a complete cathode sheath cannot fit the inter-electrode distance.

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