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The effect of electrode diameter on the ignition of the dc discharge in nitrogen VALERIY LISOVSKIY[1], VALERIY MALINOVSKIY, VERONIKA KOVAL, VLADIMIR YEGORENKOV, Kharkov National University, Svobody Sq.4, Kharkov 61022, Ukraine — This report studied the effect of electrode diameter (55 mm, 25 mm, 12 mm, 5 mm, 2.4 mm and 0.8mm) on the ignition of the discharge in nitrogen and its modes of burning. The decrease in the electrode diameter was found at large gas pressure values to discharge ignition at lesser voltage values than for large size electrodes and at low gas pressure values to the shift of breakdown curves to higher breakdown voltage values. All breakdown curves we had registered intersected at the nitrogen gas pressure value of $p = 0.9$ Torr close to the inflection point of the breakdown curves for large electrodes. To the left of the inflection point the distortion of the uniform distribution of the electric field between the electrodes of moderate diameter impedes the ionization multiplication within the discharge gap and the breakdown voltage grows, and to the left of the inflection point the conditions for gas breakdown became easier to meet due to the redistribution of the electric field.

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