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Low-pressure glow discharge with a hollow cathode VALERIY LISOVSKIY, Kharkov National University, Svobody sq.4, Kharkov 61077, Ukraine, ILLIA BOGODIELNYI, Scientific Center of Physical Technologies, Svobody sq.6, Kharkov 61022, Ukraine — We measured the breakdown curves of a dc glow discharge with hollow cathode and flat electrodes in the gap between the electrodes $L = 100$ mm. At low gas pressure, the left branches of the breakdown curves for the hollow cathode and the flat electrodes are identical. At high gas pressures, the right branch of the breakdown curve of the discharge with a hollow cathode is close to the breakdown curve for the distance between the plane electrodes, equal to the gap between the edge of the plates of the hollow cathode and flat anode. Current-voltage characteristics of the hollow cathode discharge were measured. At low gas pressure discharge is in the high-voltage (electron beam) form with ascending CVC. In the gas pressure range $p > 0.1$ Torr the discharge first burns in the glow mode. At higher current the discharge goes into the hollow cathode mode, filling the space between the plates, and it has an almost vertical CVC. The transition from a glow discharge mode into a hollow one possesses a hysteresis. At gas pressures $p \sim 1$ Torr the hollow cathode effect disappears, since the thickness of the cathode layer is small compared with the gap between the plates of the cathode.

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