Abstract Submitted
for the GEC18 Meeting of
The American Physical Society

DC glow discharge investigation in CO2 by optical emission spectroscopy V.A. LISOVSKIY, H.H. KROL, S.D. DUDIN, V.N. Karazin Kharkiv National University, 61022, Kharkov, P.A. OGLOBLINA, LPP, Ecole Polytechnique, Palaiseau, France — In the present work a glow discharge in carbon dioxide gas was studied by optical emission spectroscopy. Particular attention is paid to the processes occurring in the negative glow, the positive column and the anode glow – the most bright parts of the discharge. It is shown that in the negative glow bright emission lines of both atoms and molecules and their ions are observed: atomic oxygen 777 nm, 844 nm and 926 nm; lines of atomic oxygen ions O^+ (391 nm); bright lines of CO (the Angstrom system) and O_2 (Schumann-Runge system) molecules; lines of the molecular ion CO^+ (427 nm, Comet-tail system). Also, the molecular continuum (approximately 350 nm to 800 nm) is clearly pronounced. In the positive column, the lines of ions and atoms disappear, against the background of a weak continuum, only the emission of CO_2, CO and O_2 molecules is seen. However, in the anode glow the intensity of the continuum, the molecular and atomic lines increase significantly and may even exceed the corresponding intensities in the negative glow. Axial intensity profiles of a number of characteristic emission lines have been measured for the entire interval between the cathode and the anode.

Valeriy Lisovskiy
V.N. Karazin Kharkiv National University, 61022, Kharkov

Date submitted: 17 Jun 2018 Electronic form version 1.4