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The pulsed mode of negative DC corona discharge in nitrogen and oxygen mixture gas[1] XING ZHANG, YULIN GUO, ANBANG SUN[2], State Key Laboratory of Electrical Insulation and Power Equipment, School of Electrical Engineering, Xian Jiaotong University — The pulsed mode in electronegative gases (Trichel pulses) has been systematically investigated for many years, in which negative ions are crucial to the formation of pulses. However, the appearance of the pulsed mode in non-electronegative gases challenges the traditional concept. In this work, the pulsed mode of negative DC corona discharge in nitrogen/oxygen mixture gases (oxygen fractions ranges from 0 to 20%) is investigated with needle-plane electrodes at 100kPa. It is found that characteristics of pulsed modes of low oxygen content and high oxygen content are remarkably different, such as frequency, pulse width, waveform of the cathode voltage. The external ballast resistor and negative ion are the dominant mechanisms for the low and high oxygen content gases respectively, and these two mechanisms can be unified interpreted as an effect of impedance on the charges transfer.

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