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Electrical Properties for Capacitively Coupled Radio Frequency Discharges of Helium and Neon at Low Pressure MURAT TANISLI, NESLIHAN SAHIN, SULEYMAN DEMIR, Anadolu University — In this study, the symmetric radio frequency (RF) electrode discharge is formed between the two electrodes placing symmetric parallel. The electrical properties of symmetric capacitive RF discharge of pure neon and pure helium have been obtained from current and voltage waveforms. Calculations are done according to the homogeneous discharge model of capacitively coupled radio frequency (CCRF) using with the data in detail. Electrical properties of bulk plasma and sheath capacitance are also investigated at low pressure with this model. This study compares the electrical characteristics and sheath capacitance changes with RF power and pressure for helium and neon discharges. Also, the aim of the study is to see the differences between helium and neon discharges' current and voltage values. Their root-mean-square voltages and currents are obtained from Tektronix 3052C oscilloscope. Modified homogeneous discharge model of CCRF is used for low pressure discharges and the calculations are done using experimental results. It is seen that homogeneous discharge model of CCRF is usable with modification and then helium and neon discharge's electrical properties are investigated and presented with a comparison. Helium discharge's voltage and current characteristic have smaller values than neon's. It may be said that neon discharge is a better conductor than helium discharge. It is seen that the sheath capacitance is inversely correlation with sheath resistance.

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