

A Comparative Study of the Electrical Characteristics of Generating Argon Plasma in Different Inter-Electrode Spacing Discharges

This work aims to study the effect of different inter-electrode spacing of the DC system on the generated plasma and the electrical characteristics (I-V discharge voltage). The study uses Paschen gas pressure (I-P) curves for glass samples by niobium. The plasma is produced when the argon gas flows into the chamber at 0.08 mbar and the injected voltage of 700 V. The Paschen curve is considered for distances (2, 4, 6, 8 cm) by measuring the collapse voltage and current-voltage (I-V). From the curve flow, I-P increased due to the increment of discharge current. The best discharge current value is 40 mA while the distance is 4 cm. The results reveal that the inter-electrode spacing influences the values of the electrical characteristics of the generated plasma. The proportion of discharge voltage to discharge current is direct and nonlinear. In addition, the findings indicate that the best distance is 4 cm.