INVESTIGATION AND ANALYSIS OF DISCHARGE PARAMETERS FOR DBD CELL THROUGH ELECTRICAL MODEL

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Dielectric barrier discharges (DBDs) occur in the presence of at least one insulating layer in contact with the discharge between two planar or cylindrical electrodes connected to a high voltage supply. DBDs are the easy way to generate non-thermal and non-equilibrium plasma at atmospheric pressure [1]. This work is a contribution towards understanding the discharge parameters using a quartz coaxial and parallel DBD cell, filled with argon and xenon gas at different pressures. A sinusoidal voltage up to 2.4 kV peak with frequencies from 20 to 50 kHz is applied to the discharge electrodes for the generation of micro discharges. The results confirm the filamentary nature of discharges at different pressures and applied voltages for Argon [2] while homogeneous discharge for Xenon under the same conditions. In order to describe and characterize the discharge parameters of DBD cell, a Simulink electrical model has been proposed [3]. The relative influence of pressure and applied voltage on the discharge parameters have been investigated and further confirmed by the modified electrical model to explain the multiple peaks discharge behaviour under which special attention has been paid to discharge impedance analysis.

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