THE EFFECTS OF ELECTRODE ANGLE FOR MICRO DIELECTRIC BARRIER DISCHARGES

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An AC Plasma display panel (PDP) is a display which uses glow gas discharge at a pressure range of 400-500 Torr. It is also one example of micro dielectric barrier discharge operated in near-atmospheric pressure. Simulation is useful in order to investigate the discharge characteristics in the cell, because a PDP cell is too small to diagnose. Fluid simulation is a most practical method for a high pressure gas discharge. It gives a reasonable result in a short running time, although there are many assumptions compared with fully solved particle-in-cell simulation. Coplanar structure is the most practical model for an AC PDP. In this presentation, we investigated the discharge characteristics with the change of electrode angle using a two-dimensional fluid simulation codes. We show the result using diagnostics for the electric field intensity, charged and excited particles distributions. When the angle between two coplanar electrodes is changed, discharge characteristics changed very much. A convex electrode structure is good to reduce the driving voltage. A concave structure is effective to increase the luminance and luminous efficacy. When the amplitude of the angle increased, whether in a concave or a convex structure, the effect increased significantly.

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