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Dependence of ozone generation on the surface condition of dielectrics GO TAKAHASHI, Department of Applied Physics, National Defense Academy, Japan — Since 1990s, it has been reported that ozone concentration becomes almost zero while ozone is generating using dielectric barrier discharge, So call ozone-zero phenomena. But this phenomena has not been cleared yet. In this paper, for the first step to explain ozone-zero phenomena, the modeling of AC atmospheric pressure dielectric barrier discharges in oxygen has been done. Simulated region is 0.2cm (X:gap length) x 0.6cm (Y:lateral direction), and electrodes are covered with 0.05cm dielectric barriers. And the electrode at x=0.0cm is grounded and applied voltage Va is applied to the other electrode (f=200kHz, 7.5kV). Oxygen gas is considered and its pressure is 760Torr. The continuity equations for electrons, O+, O2+, O- , O2- and , O3- ions, electron energy equation and 60 rate equations are solved with Poisson's equation. In this simulation, a few streamer discharges are observed. In the present simulation, the ozone is mainly generated in the vicinity of dielectrics. So the surface condition of dielectrics should be one of the important parameters. Secondary electron emission coefficient dependence has been also examined. Higher secondary electron emission coefficient condition, gas temperature and atomic oxygen density are obtained higher, and the ozone is obtained not only from streamers but off the streamer too.

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