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P1.3014 Effect of electrode temperature on the generation of reactive gases and surface modification of polyimide film in an atmospheric dielectric barrier discharge plasma

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Atmospheric dielectric barrier discharge (DBD) plasma has been widely utilized in plasma bio-medicine due to generation of reactive oxygen species (ROS) and reactive nitrogen species (RNS), etc. These produced species would affect the dielectric materials by etching of dielectric surface. Polyimide (PI) is widely used as an electrode of DBD plasma source because of flexibility, good thermal resistance and permittivity.
To analyze the composition of the plasma and investigate the etched surface of PI, flexible copper clad laminates (FCCL) of Kapton ENC have been utilized, where plasma discharge conditions are the following: discharge voltage =10 kV, frequency = 5 kHz, duty = 5-10% working pressure = 760 mTorr in various electrode temperature, gas composition has been analyzed by two different spectroscopies: optical emission spectroscopy (OES) and Fourier Transform ≠ Infrared Spectroscopy (FT-IR). Various species such as O3, NO2, CO2 was generated as result of plasma-PI interaction. Etching surface of PI film was also observed by Scanning Electron Microscope (SEM).

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