
Characteristics of inkjet-printed dielectric barrier discharge source

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Due to the great applicability and validity, atmospheric pressure plasmas have attracted much attention for many scientific and industrial fields, most recently for food and agriculture (plasma farming). In particular, among various discharge types, dielectric barrier discharge (DBD) have been actively utilized because of their relatively simple structure and high-performance reliability. However, as target objects of plasma applications have become diverse and also become high-dimensional like a human body, demands of flexible and even stretchable DBD are rapidly increasing. Here, we propose a mass-manufacturable and cost-effective DBD apparatus with high flexibility. The fabrication of this flexible DBD (FXDBD) is extremely simple; thin electrodes are formed at a flexible substrate using a conventional inkjet printer with conducting nanoparticles. One crucial finding is that physical and chemical changes in inkjet-printed electrode affect the plasma characteristics. In this presentation, physiochemical properties of the inkjet-printed FXDBD and its practical challenges for plasma applications will be discussed. In the near future, we expect that the well-characterized and well-established FXDBD may extend the plasma application area and can be selectively utilized for specific purposes to from disposable to semi-permanent use.