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Characteristics of Solution Plasma Generated with Coaxial DBD KENTARO NISHIMOTO, KENJI TANAKA, TATSURU SHIRAFUJI, Osaka City University, SHIN-ICHI IMAI, Panasonic Corporation — Recently, solution plasma processing, or plasma processing in or in contact with an aqueous solution, has attracted much attention because of its various possible applications. Although different types of plasma generation methods have been proposed, most of them do not cover a wide range of electrical conductivity of the water to be treated. Since the water subjected to the plasma treatment can have any values of electrical conductivity depending on the purposes of treatments, we must develop methods that cover a wide range of electrical conductivity of water. The conventional solution plasma has shown a strong dependence on the electrical conductivity of water, in which stable discharge is available only in the water with an electrical conductivity of $100\pm50 \ \mu\text{S/cm}$. The coaxial-type DBD in contrast has shown intense discharge within the conductivity range of 0.5-160 μ S/cm. This result indicates that the coaxial type DBD has more "robust" dependence on the electrical conductivity of water. Furthermore, the coaxial type DBD has shown 3-fold higher energy efficiency in indigo carmine degradation than the conventional solution plasma.

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