

**THE DEVELOPMENT OF THE ELECTRODE FOR  
GENERATING LARGE-VOLUME PULSED PLASMA  
USING FOR THE DECOMPOSITION OF THE  
ENVIRONMENTAL HARMFUL CHEMICALS**

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The pulsed power technology has been studied for applying to the degradation of the air and water pollutant, such as NO<sub>x</sub>, VOC and detergent, using non-thermal plasma. In many case, a wire-cylindrical electrode is used for a reactor. For achieving high throughput in the treatment, the volume of the reactor using for these environmental application has to be large. However, when an electrode distance is made to be long for large volume, the higher voltage is necessary. In this case, the size of a pulse generator becomes large. Therefore, we have developed the electrode characterized by being able to generate large-volume pulsed plasma at low applied voltage. The electrode contributes to the treatment system which does not need a large facility space. The electrode is a co-axial electrode with wire, inner cylinder and outer cylinder. The cylindrical electrode consisted of a mesh. The large volume pulsed plasma has been realized by generating the discharge between the inner and outer cylinder by using preionization effect from a discharge between the wire and the inner cylinder. To investigate basic property of the preionization effect, we also used wire and two mesh plane electrodes. Ultraviolet, which radiated from the discharge between the wire electrode and the mesh plane electrode, initiates photo-ionization between two mesh plane electrodes. Therefore, the timing applying the voltage to each electrode is important to utilize many initial electrons. We have investigated the timing applying the voltage for generating uniform and wide discharge.