Characteristics of Plasma Jet from Syringe Electrode
Covered with Glass Tube

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In the plasma jet device assembled with the syringe electrode into the glass tube, the characteristics of plasma plume is investigated with various parameters, such as the location of ground electrode, the distance between electrodes, the radius of syringe and glass, the hole size and shape of glass tube muzzle, the gas flow rate, and the gas species as He, Ne, Ar, and N₂. When the plasma jet device is operated by the high voltage power of DC-AC inverter with low frequency of several tens of kHz, the basic data of current-voltage including the breakdown are examined according to those parameters. The presence of ground electrode gives the adjustability of plasma jet current and the length of plasma plume. The distance between the syringe electrode and the ground electrode also affects the ignition voltage and the current.¹ The hole of tube muzzle and the glass tube parameters provide the length and the fineness of plasma jet emitting from the end of glass tube. There exists the optimal range of gas flow rate which also affects the discharge characteristics. The various gas species of plasma jets are also examined to be compared with each others.