

ABSTRACT

A plasma processing device includes: a chamber configured to perform a plasma process of a subject to be processed inside of the chamber, the inside of the chamber being configured to be compressed; a flat-plate-shaped first electrode disposed in the chamber and on which the subject to be processed is mounted; a first high frequency power supply configured to apply a bias voltage of a first frequency to the first electrode; a helical second electrode disposed outside the chamber and disposed to face the first electrode with a quartz plate forming an upper lid of the chamber therebetween; and a gas introducing unit configured to introduce a fluorine-containing process gas from a gas introducing port into the chamber, the gas introducing port being disposed in the upper lid or the vicinity thereof, in which a second high frequency power supply and a third high frequency power supply are configured to be electrically connected to the second electrode, the second high frequency power supply being configured to apply an AC voltage of a second frequency to the second electrode, the third high frequency power supply being configured to apply an AC voltage of a third frequency to the second electrode, and the third frequency being higher than the second frequency; and two types of AC voltages are configured to be simultaneously applied.