

3. The plasma processing apparatus of Claim 1 or 2,

wherein the control unit adjusts a phase difference between the first high frequency power supplied to the first electrode and the first high frequency power supplied to the second electrode.

4. The plasma processing apparatus of Claim 3,

wherein the control unit adjusts the phase difference between ~~a~~the first high frequency power supplied to the first electrode and ~~a~~the first high frequency power supplied to the second electrode to be 180°.

5. The plasma processing apparatus of Claim 1, further comprising:

a second gas supply device configured to supply a second processing gas into the processing space,

wherein the second high frequency power supply supplies the second high frequency power to the mounting table to generate a third plasma of the first processing gas and the second processing gas supplied into the processing space and to attract ions in the third plasma into the processing target object,

the control unit controls ON/OFF of the second high frequency power supply, intermittently,

during a period while the second high frequency power supply is controlled to be turned OFF, by controlling the ratio between the first high frequency power supplied to the first electrode and the first high frequency power supplied to the second electrode, the control unit adjusts the amount of the electrons in the first plasma introduced into the processing space from the internal space through the communication holes; activates a surface of the processing target object by the electrons; and generates a reaction product by reacting the activated surface of the processing target object with the radicals in the first plasma introduced into the processing space, and