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Abstract of the Disclosure

A plasma processing apparatus and a plasma processing method are provided. The plasma processing apparatus and a plasma processing method are capable of easily performing precise working of a fine pattern to a large sized sample having a diameter of 300 mm or larger, and also capable of improving a selectivity during micro processing.

A plasma processing apparatus comprising a vacuum processing chamber, a plasma generating means including a pair of electrodes, a sample table for mounting a sample to be processed inside the vacuum processing chamber and also serving as one of the electrodes, and a evacuating means for evacuating the vacuum processing chamber, which further comprises a high frequency electric power source for applying an electric power of a VHF band from 50 MHz to 200 MHz between the pair of electrodes; and a magnetic field forming means for forming a static magnetic field or a low frequency magnetic field larger than 10 gausses and smaller than 110 gausses in a direction intersecting an electric field generated between the pair of electrodes and the vicinity by the high frequency electric power source; therein the magnetic field forming means being set so that a portion where a component of the magnetic field in a direction along the surface of the sample table becomes maximum is brought to a position in the opposite side of the sample table from the middle of the both electrodes; an electron cyclotron resonance region being

formed between the both electrodes by the magnetic field and the electric field.

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