2. The plasma processing method of Claim 1, further comprising:

calculating, by a time adjusting unit of the plasma processing apparatus, a first time difference from when transitioning to the first succeeding stage to the first time point;

adjusting a length of a preset processing time of the same stage as the first succeeding stage in a cycle performed after a preceding cycle among the multiple cycles to be increased by the first time difference obtained in the preceding cycle among the multiple cycles;

calculating, by the time adjusting unit, a second time difference from when transitioning to the second succeeding stage to the second time point; and

adjusting a length of a preset processing time of the same stage as the second succeeding stage in a cycle performed after a preceding cycle among the multiple cycles to be increased by the second time difference obtained in the preceding cycle among the multiple cycles.

3. The plasma processing method of Claim 1,

wherein the first preceding stage is a first stage of generating plasma of a first processing gas while the first high frequency power is being supplied to the either one electrode,

the first succeeding stage and the second preceding stage are a second stage which follows the first stage and generates plasma of a second processing gas while the second high frequency power is being supplied to the second electrode, and

the second succeeding stage is a third stage which follows the second stage and generates plasma of a third processing gas while the first high frequency power is being supplied to the either one electrode.

4. The plasma processing method of Claim 3,

wherein the first processing gas contains a rare gas and a fluorocarbon gas,

the second processing gas contains a rare gas, and

the third processing gas contains a rare gas and an oxygen gas.

5. The plasma processing method of Claim 3,

wherein the plasma of the first processing gas is generated in the first stage while the second high frequency power is not supplied to the second electrode,

the plasma of the second processing gas is generated in the second stage while the first high frequency power is not supplied to the either one electrode, and

the plasma of the third processing gas is generated in the third stage while the second high frequency power is not supplied to the second electrode.

6. The plasma processing method of Claim 1,

wherein the plasma processing apparatus further comprises a DC power supply connected to the first electrode and configured to generate a negative DC voltage, and

the plasma processing method further comprises changing a level of the DC voltage at the first time point and/or the second time point.