

## CLAIMS

1. A method for using different variables based on a state associated with a plasma system, comprising:

determining whether the state associated with the plasma system is a first state or a second state;

determining a first variable upon determining that the state is the first state, the first variable determined based on a measurement at a communication medium, the communication medium located between a radio frequency (RF) generator and a plasma chamber of the plasma system;

determining a second variable upon determining that the state is the second state, the second variable determined based on a measurement at the communication medium;

determining whether the second variable exceeds a first threshold;

providing an instruction to reduce power supplied to the plasma chamber upon determining that the second variable exceeds the first threshold; and

providing an instruction to increase power supplied to the plasma chamber upon determining that the second variable is below the first threshold,

wherein the method is executed by one or more processors.

2. The method of claim 1, wherein the first variable is power, wherein the second variable is ion energy, and wherein the first threshold is a threshold ion energy.
3. The method of claim 2, wherein the ion energy is a function of an RF voltage and a bias potential.
4. The method of claim 1, wherein the first variable is power and the second variable is an RF voltage.
5. The method of claim 1, further comprising:

determining whether the first variable exceeds a second threshold;

providing an instruction to reduce the power supplied to the plasma chamber upon determining that the first variable exceeds the second threshold; and

providing an instruction to increase the power supplied to the plasma chamber upon determining that the first variable is below the second threshold.

6. The method of claim 5, wherein the second threshold is a power threshold.
7. The method of claim 5, wherein providing the instruction to reduce the power upon determining that the first variable exceeds the second threshold comprises providing the instruction to reduce the power to achieve the second threshold.
8. The method of claim 5, wherein providing the instruction to increase the power comprises providing the instruction to increase the power to achieve the second threshold.
9. The method of claim 1, wherein the first state is associated with a first use of the plasma system and the second state is associated with a second use of the plasma system.
10. The method of claim 9, wherein the first use includes etching a substrate and the second use includes depositing one or more layers on the substrate.
11. The method of claim 9, wherein the first use includes etching a substrate at a higher rate than an etch rate associated with the second use.
12. A method for using ion energy for states associated with a plasma system, comprising:
  - determining whether the state associated with the plasma system is a first state or a second state;
  - determining an ion energy associated with a plasma chamber upon determining that the state is the second state;
  - determining whether the ion energy matches a first ion energy threshold; and
  - providing an instruction to change power supplied to the plasma chamber upon determining that the ion energy exceeds the first ion energy threshold,wherein the method is executed by one or more processors.

13. The method of claim 12, wherein the ion energy is a function of an RF voltage and a bias potential.
14. The method of claim 12, further comprising:
- determining an ion energy associated with the plasma chamber upon determining that the state is the first state;
  - determining whether the ion energy for the first state matches a second ion energy threshold; and
  - providing an instruction to change the power supplied to the plasma chamber upon determining that the ion energy for the first state does not match the second ion energy threshold.
15. The method of claim 14, wherein the first ion energy threshold is associated with a higher etch rate than an etch rate associated with the second ion energy threshold.
16. A plasma system for using different variables based on a state associated with the plasma system, comprising:
- a plasma chamber including:
    - a chuck for supporting a substrate; and
    - an upper electrode located above the chuck;
  - an impedance matching circuit coupled to the plasma chamber via a first communication medium;
  - a radio frequency (RF) generator coupled to the impedance matching circuit via a second communication medium;
  - a sensor coupled to the first communication medium for generating a first measurement and a second measurement from RF signals transferred via the first communication medium;
  - a processor coupled to the RF generator, the processor configured to:
    - determine whether the state associated with the plasma system is a first state or a second state;

determine a first variable upon determining that the state is the first state, the first variable determined based on the first measurement;

determine a second variable upon determining that the state is the second state, the second variable determined based on the second measurement;

determine whether the second variable exceeds a first threshold;

provide an instruction to reduce power supplied to the plasma chamber upon determining that the second variable exceeds the first threshold; and

provide an instruction to increase the power supplied to the plasma chamber upon determining that the second variable is below the first threshold.

17. The plasma system of claim 16, wherein the first variable is power and the second variable is voltage.

18. A plasma system for using different variables based on a state associated with the plasma system, comprising:

a plasma chamber including:

a chuck for supporting a substrate; and

an upper electrode on top of the chuck;

an impedance matching circuit coupled to the plasma chamber via a first communication medium;

a radio frequency (RF) generator coupled to the impedance matching circuit via a second communication medium;

a sensor for generating a first measurement and a second measurement from RF signals transferred via the first communication medium;

a processor coupled to the RF generator, the processor configured to:

determine whether a state associated with the plasma system is a first state or a second state;

determine an ion energy associated with the plasma chamber upon determining that the state is the second state, the ion energy determined based on the first measurement;

determine whether the ion energy exceeds a first ion energy threshold;

provide an instruction to reduce power supplied to the plasma chamber upon determining that the ion energy exceeds the first ion energy threshold; and

provide an instruction to increase the power supplied to the plasma chamber upon determining that the ion energy is below the first ion energy threshold.

19. The plasma system of claim 18, wherein the ion energy is a function of an RF voltage and a bias potential.

20. The plasma system of claim 19, wherein the processor is further configured to:

determine an ion energy associated with the plasma chamber upon determining that the state is the first state;

determine whether the ion energy for the first state exceeds a second ion energy threshold;

provide an instruction to reduce the power supplied to the plasma chamber upon determining that the ion energy for the first state exceeds the second ion energy threshold; and

provide an instruction to increase the power supplied to the plasma chamber upon determining that the ion energy is below the second ion energy threshold.