

WHAT IS CLAIMED IS:

1. A substrate processing apparatus comprising:
 - a housing having a process space;
 - a support unit configured to support a substrate in the process space;
 - 5 a gas supply unit to supply process gas to the process space;
 - a dielectric plate disposed to face the substrate supported by the support unit in the process space;
 - an upper electrode spaced apart from the dielectric plate while surrounding the dielectric plate when viewed from atop; and
 - 10 a controller,
 - wherein the support unit includes:
 - a chuck having a support surface to support the substrate and connected with a power source; and
 - a lower electrode disposed to face the upper electrode while surrounding the
 - 15 chuck when viewed from a top,
 - wherein the gas supply unit includes:
 - a first gas supply part configured to supply the process gas to a central area of the substrate supported by the chuck; and
 - a second gas supply part configured to supply the process gas through a space
 - 20 between the dielectric plate and the upper electrode which are provided on an edge area of the substrate supported by the chuck, and
 - wherein the controller is configured to:
 - control the gas supply unit such that a supply flow rate per unit time for the process gas supplied from the first gas supply part is greater than a supply flow rate
 - 25 per unit time for the process gas supplied from the second gas supply part when

processing the edge area of the substrate supported by the chuck.

2. The substrate processing apparatus of claim 1, wherein the controller is configured to:

5 control the gas supply unit such that only the first gas supply part supplies the process gas, when processing the edge area of the substrate supported by the chuck.

3. The substrate processing apparatus of claim 1, wherein the support unit, the dielectric plate, and the upper electrode are provided, such that a volume of a space,
10 in which the process gas supplied by the gas supply unit flows, is larger in the edge area of the substrate supported by the chuck than the central area of the substrate supported by the chuck, when viewed from the top.

4. The substrate processing apparatus of claim 1, wherein the support unit
15 further includes:

an insulating ring interposed between the chuck and the lower electrode.

5. The substrate processing apparatus of claim 4, wherein the insulating ring and the lower electrode are spaced apart from a bottom surface of the edge area
20 of the substrate supported by the chuck.

6. The substrate processing apparatus of claim 1, wherein a molecular weight of the process gas supplied from the first gas supply part is equal to a molecular weight of the process gas supplied from the second gas supply part.

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7. The substrate processing apparatus of claim 1, wherein the controller is configured to:

control the support unit and the gas supply unit such that the power source applies power to the chuck to generate plasma at the edge area of the substrate supported by the chuck when the first gas supply part and/or the second gas supply part supplies the process gas.

8. A method for processing a substrate using the substrate processing apparatus of claim 1, the method comprising:

processing the edge area of the substrate supported by the chuck by supplying plasma,

wherein a supply flow rate unit time for the process gas supplied to the central area of the substrate is greater than a supply flow rate unit time for the process gas supplied to the edge area of the substrate, when the edge area of the substrate is processed.

9. The method of claim 8, wherein the process gas is supplied only to the central area of the substrate, when the edge area of the substrate is processed.

10. A substrate processing apparatus comprising:

a housing having a process space;

a support unit configured to support a substrate in the process space;

a gas supply unit to supply process gas to the process space;

a dielectric plate disposed to face the substrate supported by the support unit in the process space;

an upper electrode spaced apart from the dielectric plate while surrounding the dielectric plate when viewed from a top; and

a controller,

wherein the support unit further includes:

5 a chuck having a support surface to support the substrate and connected with a power source; and

a lower electrode disposed to face the upper electrode while surrounding the chuck when viewed from the top,

wherein the gas supply unit includes:

10 a first gas supply part configured to supply the process gas to a central area of the substrate supported by the chuck; and

wherein the support unit, the dielectric plate, and the upper electrode are provided, such that a volume of a space, in which the process gas supplied by the gas supply unit flows, is larger in the edge area of the substrate supported by the chuck
15 than the central area of the substrate supported by the chuck, when viewed from the top, and

wherein the controller is configured to:

control the gas supply unit such that only the first gas supply part supplies the process gas, when processing the edge area of the substrate supported by the chuck;

20 wherein the gas supply unit includes:

a second gas supply part configured to supply the process gas through a space between the dielectric plate and the upper electrode which are provided on the edge area of the substrate supported by the chuck, and

wherein the controller is configured to:

25 control the gas supply unit such that a total molecular weight per unit time for

the process gas supplied from the first gas supply part is greater than a total molecular weight per unit time for the process gas supplied from the second gas supply part, when processing the edge area of the substrate supported by the chuck.

5 11. The substrate processing apparatus of claim 10, wherein the support unit further includes:

an insulating ring interposed between the chuck and the lower electrode.

10 12. The substrate processing apparatus of claim 11, wherein the insulating ring and the lower electrode are spaced apart from a bottom surface of the edge area of the substrate supported by the chuck.

15 13. The substrate processing apparatus of claim 10, wherein the controller is configured to:
control the support unit and the gas supply unit such that the power source applies power to the chuck to generate plasma at the edge area of the substrate supported by the chuck when the first gas supply part and/or the second gas supply part supplies the process gas.

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