

[CLAIMS]

1. A substrate processing method comprising:

(a) accommodating a substrate retainer in a process chamber, wherein the substrate retainer comprises:

5 a substrate support capable of supporting a substrate; and

a partition plate support capable of supporting an upper partition plate provided above the substrate supported by the substrate support;

(b) setting a distance between the substrate and the upper partition plate to a first gap;

(c) supplying a first gas to the substrate through a gas supply port in a state where the
10 distance between the substrate and the upper partition plate is maintained at the first gap;

(d) setting the distance between the substrate and the upper partition plate to a second gap; and

(e) supplying an additional gas to the substrate through the gas supply port in a state where the distance between the substrate and the upper partition plate is maintained at the second
15 gap.

2. The substrate processing method of claim 1, wherein the second gap is narrower than the first gap.

20 3. The substrate processing method of claim 2, wherein, in (c), the substrate is arranged below the gas supply port.

4. The substrate processing method of claim 2, wherein, in (e), the substrate is arranged above the gas supply port.

25

5. The substrate processing method of claim 1, wherein a plurality of substrates comprising the substrate are supported by the substrate support to be arranged in a vertical direction at a predetermined interval therebetween, and

wherein a plurality of upper partition plates comprising the upper partition plate are supported by the partition plate support between the plurality of substrates, respectively.

6. The substrate processing method of claim 1, wherein the additional gas comprises a film-forming inhibitory gas.

7. The substrate processing method of claim 1, further comprising (f) supplying another gas to the substrate through the gas supply port between (c) and (e) while maintaining the distance between the substrate and the upper partition plate at the first gap.

8. The substrate processing method of claim 7, wherein the first gas comprises a source gas, and the another gas comprises a reactive gas.

9. The substrate processing method of claim 1, wherein a trench is formed on the substrate.

10. The substrate processing method of claim 9, wherein a film-forming inhibitory layer is formed at an entrance portion of the trench by supplying a film-forming inhibitory gas as the additional gas in (e) in a state where the second gap is narrower than the first gap.

11. The substrate processing method of claim 10, wherein the film-forming inhibitory gas comprises a chlorine-containing gas.

12. The substrate processing method of claim 1, wherein the distance between the substrate and the upper partition plate is adjusted to the first gap in (b) and the distance between the substrate and the upper partition plate is adjusted to the second gap in (d) by a driver capable of adjusting the distance between the substrate and the upper partition plate.

13. A method of manufacturing a semiconductor device, comprising:

(a) accommodating a substrate retainer in a process chamber, wherein the substrate retainer comprises:

a substrate support capable of supporting a substrate; and

a partition plate support capable of supporting an upper partition plate provided above the substrate supported by the substrate support;

(b) setting a distance between the substrate and the upper partition plate to a first gap;

(c) supplying a first gas to the substrate at the first gap through a gas supply port in a state where the distance between the substrate and the upper partition plate is maintained at the first gap;

(d) setting the distance between the substrate and the upper partition plate to a second gap; and

(e) supplying a second gas to the substrate at the second gap through the gas supply port in a state where the distance between the substrate and the upper partition plate is maintained at the second gap.

14. A substrate processing apparatus comprising:

a process chamber in which a substrate retainer is accommodated, wherein the substrate retainer comprises:

a substrate support capable of supporting a substrate; and

a partition plate support capable of supporting an upper partition plate provided above the substrate supported by the substrate support;

5 a driver capable of adjusting a distance between the substrate and the upper partition plate by vertically driving either the substrate support or the partition plate support;

a gas supplier through which a gas is supplied to the substrate accommodated in the process chamber; and

a controller configured to be capable of controlling the driver and the gas supplier to perform:

10 (a) accommodating the substrate retainer in the process chamber;

(b) setting the distance between the substrate and the upper partition plate to a first gap;

(c) supplying a first gas to the substrate through a gas supply port provided at the gas supplier in a state where the distance between the substrate and the upper partition plate
15 is maintained at the first gap;

(d) setting the distance between the substrate and the upper partition plate to a second gap; and

(e) supplying a second gas to the substrate at the second gap through the gas supply port provided at the gas supplier in a state where the distance between the substrate and
20 the upper partition plate is maintained at the second gap.

15. The substrate processing apparatus of claim 14, wherein a plurality of substrates comprising the substrate are supported by the substrate support to be arranged in a vertical direction at a predetermined interval therebetween, and

25 wherein a plurality of upper partition plates comprising the upper partition plate are

supported by the partition plate support between the plurality of substrates, respectively.