

WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device, comprising:
providing a substrate in a process chamber; and
forming a film on the substrate in the process chamber by supplying an inert gas from a first supplier, supplying a first processing gas from a second supplier, and supplying an inert gas from a third supplier to the substrate, the third supplier being installed at an opposite side of the first supplier with respect to a straight line, which passes through the second supplier and a center of the substrate and is interposed between the first supplier and the third supplier, and the first supplier and the third supplier being disposed in line symmetry with the straight line as a symmetry axis,
wherein in the act of forming the film, a substrate in-plane film thickness distribution of the film is adjusted by controlling a balance between a flow rate of the inert gas supplied from the first supplier and a flow rate of the inert gas supplied from the third supplier.
2. The method of Claim 1, wherein in the act of forming the film, the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier are set to be different from each other.
3. The method of Claim 1, wherein in the act of forming the film, one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier.
4. The method of Claim 3, wherein in the act of forming the film, the one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than a flow rate of the first processing gas.

5. The method of Claim 3, wherein in the act of forming the film, the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be lower than a flow rate of the first processing gas.

6. The method of Claim 3, wherein in the act of forming the film, the one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than a flow rate of the first processing gas and the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be lower than the flow rate of the first processing gas.

7. The method of Claim 3, wherein in the act of forming the film, the one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than a flow rate of the first processing gas and the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to zero.

8. The method of Claim 3, wherein in the act of forming the film, the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to zero.

9. The method of Claim 1, wherein in the act of forming the film,
a condition, in which the substrate in-plane film thickness distribution of the film becomes a central convex distribution when the film is formed on a bare substrate, is established by setting the flow rate of the inert gas supplied from the first supplier to be equal to the flow rate of the inert gas supplied from the third supplier, and

a condition, in which the substrate in-plane film thickness distribution of the film becomes any distribution between a central convex distribution and a central concave distribution when the film is formed on a bare substrate, is established by setting the flow rate of

the inert gas supplied from the first supplier to be different from the flow rate of the inert gas supplied from the third supplier.

10. The method of Claim 9, wherein, when the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier are set to be equal to each other, the respective flow rates are set to be higher than a flow rate of the first processing gas.

11. The method of Claim 9, wherein, when the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier are set to be different from each other, one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier, and the one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than a flow rate of the first processing gas.

12. The method of Claim 9, wherein, when the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier are set to be different from each other, one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier, and the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be lower than a flow rate of the first processing gas.

13. The method of Claim 9, wherein, when the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier are set to be

different from each other, one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier, the one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than a flow rate of the first processing gas, and the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be lower than the flow rate of the first processing gas.

14. The method of Claim 9, wherein, when the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier are set to be different from each other, one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier, the one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than a flow rate of the first processing gas, and the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to zero.

15. The method of Claim 9, wherein, when the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier are set to be different from each other, one of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to be higher than the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier, and the other of the flow rate of the inert gas supplied from the first supplier and the flow rate of the inert gas supplied from the third supplier is set to zero.

16. The method of any one of Claims 1 to 15, wherein in the act of forming the film, a

second processing gas having a molecular structure different from a molecular structure of the first processing gas is supplied to the substrate in the process chamber.

17. The method of Claim 16, wherein in the act of forming the film, a cycle is performed a predetermined number of times, the cycle including non-simultaneously performing:

supplying the inert gas from the first supplier, supplying the first processing gas from the second supplier, and supplying the inert gas from the third supplier to the substrate in the process chamber; and

supplying the second processing gas to the substrate in the process chamber.

18. The method of Claim 17, wherein in the act of supplying the second processing gas, the second processing gas is supplied from at least one selected from the group of the first supplier and the third supplier.

19. A substrate processing apparatus comprising:

a process chamber in which a substrate is processed;

a first supply system configured to supply an inert gas from a first supplier to the substrate in the process chamber;

a second supply system configured to supply a first processing gas from a second supplier to the substrate in the process chamber;

a third supply system configured to supply an inert gas from a third supplier to the substrate in the process chamber, the third supplier being installed at an opposite side of the first supplier with respect to a straight line, which passes through the second supplier and a center of the substrate in the process chamber and is interposed between the first supplier and the third supplier, and the first supplier and the third supplier being disposed in line symmetry with the straight line as a symmetry axis; and

a controller configured to control the first supply system, the second supply system, and the third supply system so as to perform a process of forming a film on the substrate by

supplying the inert gas from the first supplier, supplying the first processing gas from the second supplier, and supplying the inert gas from the third supplier to the substrate provided in the process chamber, wherein in the act of forming the film, a substrate in-plane film thickness distribution of the film is adjusted by controlling a balance between a flow rate of the inert gas supplied from the first supplier and a flow rate of the inert gas supplied from the third supplier.

20. A program that causes, by a computer, a substrate processing apparatus to perform a process comprising:

providing a substrate in a process chamber; and

forming a film on the substrate in the process chamber by supplying an inert gas from a first supplier, supplying a first processing gas from a second supplier, and supplying an inert gas from a third supplier to the substrate, the third supplier being installed at an opposite side of the first supplier with respect to a straight line, which passes through the second supplier and a center of the substrate and is interposed between the first supplier and the third supplier, and the first supplier and the third supplier being disposed in line symmetry with the straight line as a symmetry axis,

wherein in the act of forming the film, a substrate in-plane film thickness distribution of the film is adjusted by controlling a balance between a flow rate of the inert gas supplied from the first supplier and a flow rate of the inert gas supplied from the third supplier.