[CLAIMS]

[Claim 1]

A method of manufacturing a semiconductor device, comprising:

(a) forming a first layer on a substrate by performing a first layer forming cycle once or more, wherein the first layer forming cycle comprises:

(a1) supplying a first element-containing gas to the substrate;

(a2) supplying a third reducing gas to the substrate; and

(a3) supplying a first reducing gas to the substrate a plurality of times,

wherein (a3) is performed before (a2) is started; and

(b) forming a second layer on the first layer by performing a second layer forming cycle once or more after (a), wherein the second layer forming cycle comprises:

(b1) supplying a second element-containing gas to the substrate;

(b2) supplying the third reducing gas to the substrate; and

(b3) supplying a second reducing gas to the substrate,

wherein (b2) is performed before (b3) is started.

[Claim 2]

The method of claim 1, wherein the first layer forming cycle further comprises:

(a4) supplying a silicon-containing gas to the substrate, and

wherein (a4) is started while (a1) is performed.

[Claim 3]

The method of claim 1, wherein the first layer forming cycle further comprises:

(a4) supplying a silicon-containing gas to the substrate, and

wherein (a4) is performed after (a1) is completed.

[Claim 4]

The method of claim 2, wherein (a4) continues to be performed after (a1) is completed.

[Claim 5]

The method of claim 1, wherein the first layer forming cycle further comprises:

(a4) supplying a silicon-containing gas to the substrate, and

wherein (a4) is performed after (a3) is completed.

[Claim 6]

The method of claim 1, wherein the first layer forming cycle further comprises:

(a5) purging a process chamber during a time interval between each of the times of supplying the first reducing gas and a next time of supplying the first reducing gas in (a3).

[Claim 7]

The method of claim 6, wherein (a5) comprises:

(a51) supplying an inert gas to the substrate; and

(a52) exhausting the process chamber, and

wherein (a51) and (a52) are sequentially performed in (a5).

[Claim 8]

The method of claim 1, wherein the first layer forming cycle further comprises:

(a6) performing a sub-cycle a plurality of times after (a3), wherein the sub-cycle comprises:

(a61) supplying an inert gas to the substrate; and

(a62) exhausting a process chamber.

[Claim 9]

The method of claim 1, wherein the second layer forming cycle further comprises:

(b4) supplying a silicon-containing gas to the substrate, and

wherein (b4) is started while (b1) is performed.

[Claim 10]

The method of claim 1, wherein the second layer forming cycle further comprises:

(b4) supplying a silicon-containing gas to the substrate, and

wherein (b4) is performed after (b1) is completed.

[Claim 11]

The method of claim 9, wherein (b4) continues to be performed after (b1) is completed.

[Claim 12]

The method of claim 1, wherein the first layer forming cycle is repeatedly performed in (a) until a thickness of the first layer is equal to or greater than 5 Å.

[Claim 13]

The method of claim 1, wherein a first element contained in the first element-containing gas is same as a second element contained in the second element-containing gas.

[Claim 14]

The method of claim 1, wherein a first element contained in the first element-containing gas is different from a second element contained in the second element-containing gas.

[Claim 15]

The method of claim 1, wherein the number of times of performing the first layer forming cycle in (a) is smaller than the number of times of performing the second

layer forming cycle in (b).

[Claim 16]

A substrate processing apparatus, comprising:

a gas supplier configured to supply a first element-containing gas, a first reducing gas, a second element-containing gas and a second reducing gas;

an exhauster configured to exhaust an inner atmosphere; and

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

(a) forming a first layer on a substrate by performing a first layer forming cycle once or more, wherein the first layer forming cycle comprises:

(a1) supplying the first element-containing gas to the substrate;

(a2) supplying a third reducing gas to the substrate; and

(a3) supplying the first reducing gas to the substrate a plurality of times, and

wherein (a3) is performed before (a2) is started; and

(b) forming a second layer on the first layer by performing a second layer forming cycle once or more after (a), wherein the second layer forming cycle comprises:

(b1) supplying the second element-containing gas to the substrate;

(b2) supplying the third reducing gas to the substrate; and

(b3) supplying the second reducing gas to the substrate, and

wherein (b2) is performed before (b3) is started.

[Claim 17]

A program that causes, by a computer, a substrate processing apparatus to perform:

(a) forming a first layer on a substrate by performing a first layer forming cycle once or more, wherein the first layer forming cycle comprises:

(a1) supplying a first element-containing gas to the substrate;

(a2) supplying a third reducing gas to the substrate; and

(a3) supplying a first reducing gas to the substrate a plurality of times, and

wherein (a3) is performed before (a2) is started; and

(b) forming a second layer on the first layer by performing a second layer forming cycle once or more after (a), wherein the second layer forming cycle comprises:

(b1) supplying a second element-containing gas to the substrate;

(b2) supplying the third reducing gas to the substrate; and

(b3) supplying a second reducing gas to the substrate, and

wherein (b2) is performed before (b3) is started.