[CLAIMS]

[Claim 1]

A substrate processing method comprising:

(a1) supplying a first process gas such that a transfer velocity of the first process gas toward an edge region of a substrate is faster than the transfer velocity of the first process gas toward a central region of the substrate;

(a2) supplying a second process gas such that a transfer velocity of the second process gas toward the central region of the substrate is faster than the transfer velocity of the second process gas toward the edge region of the substrate; and

(b) supplying a reactive gas toward the substrate,

wherein, in (a1), in parallel with supplying the first process gas toward the edge region of the substrate from a first gas supplier provided at a central region of a zone beside a periphery of the substrate, an inert gas is supplied toward the edge region of the substrate from a second gas supplier provided at another region of the zone horizontally adjacent to the central region of the zone, and

wherein, in (a2), the second process gas is supplied toward the central region of the substrate from the first gas supplier.

[Claim 2]

The substrate processing method of claim 1, wherein a primary constituent of the first process gas in (a1) is equal to a primary constituent of the second process gas in (a2).

[Claim 3]

The substrate processing method of claim 1, wherein a source gas contained in the first process gas in (a1) is equal to a source gas contained in the second process gas in (a2).

[Claim 4]

The substrate processing method of claim 1, wherein, in (a1), in parallel with supplying

the first process gas at a first flow rate toward the edge region of the substrate, the inert gas is supplied at a second flow rate greater than the first flow rate toward the edge region of the substrate.

[Claim 5]

The substrate processing method of claim 4, wherein, in (a2), in parallel with supplying the second process gas toward the central region of the substrate, the inert gas is supplied at a third flow rate toward the central region of the substrate.

[Claim 6]

The substrate processing method of claim 1, wherein, in (a1), the first process gas is supplied in parallel with supplying the inert gas toward the edge region of the substrate, and after a predetermined time has elapsed, supplying the inert gas toward the edge region is stopped, and

wherein, in (a2), supplying the inert gas serving as a carrier gas of the second process gas is started while the second process gas is being supplied.

[Claim 7]

The substrate processing method of claim 1, wherein, in (a1), the inert gas reaches the edge region of the substrate more than the first process gas.

[Claim 8]

The substrate processing method of claim 1, wherein (b) is performed after (a1) and (a2) are repeatedly performed a plurality of times.

[Claim 9]

A substrate processing method comprising:

(a1) supplying a first process gas such that a transfer velocity of the first process gas toward an edge region of a substrate is faster than the transfer velocity of the first process gas toward a central region of the substrate;

(a2) supplying a second process gas such that a transfer velocity of the second process

gas toward the central region of the substrate is faster than the transfer velocity of the second process gas toward the edge region of the substrate; and

(b) supplying a reactive gas toward the substrate,

wherein, in (a1), in parallel with supplying the first process gas toward the edge region of the substrate from a central region of a zone beside a periphery of the substrate, an inert gas is supplied toward the edge region of the substrate from another region of the zone horizontally adjacent to the central region of the zone, and

wherein, in (a2), the second process gas is supplied toward the central region of the substrate through the central region of the zone beside the periphery of the substrate.

[Claim 10]

The substrate processing method of claim 1, wherein a hole that opens toward a center of the substrate and a hole that opens toward the edge region of the substrate are provided at a front end of the first gas supplier.

[Claim 11]

The substrate processing method of claim 1, wherein a hole that opens toward the edge region of the substrate is provided at a front end of the second gas supplier.

[Claim 12]

The substrate processing method of claim 1, wherein a third gas supplier is provided horizontally adjacent to the first gas supplier in a manner that the first gas supplier is interposed between the second gas supplier and the third gas supplier, and

wherein, in (a1), a supply amount of the inert gas supplied from the second gas supplier is equal to a supply amount of the inert gas supplied from the third gas supplier.

[Claim 13]

The substrate processing method of claim 1, wherein each of the first process gas and the second process gas comprises a gas containing a silicon-silicon bond, whose properties

contain an undecomposed time during which a predetermined decomposition rate is maintained under a predetermined condition and a decomposition time during which a decomposition rate higher than the predetermined decomposition rate is maintained under other predetermined condition.

[Claim 14]

The substrate processing method of claim 1, wherein, in (a2), a carrier gas is supplied in addition to the second process gas for the second process gas to reach the central region of the substrate during an undecomposed time of the second process gas.

[Claim 15]

The substrate processing method of claim 1, wherein, in (a1), a carrier gas is supplied in addition to the first process gas for the first process gas to reach the edge region of the substrate during an undecomposed time of the first process gas.

[Claim 16]

A method of manufacturing a semiconductor device comprising the substrate processing method of claim 1.

[Claim 17]

A substrate processing apparatus comprising:

a substrate retainer configured to support a substrate;

a first gas supplier through which a first process gas is supplied to the substrate supported by the substrate retainer;

a second gas supplier through which a second process gas is supplied to the substrate supported by the substrate retainer; and

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

(a1) supplying the first process gas such that a transfer velocity of the first

process gas toward an edge region of the substrate is faster than the transfer velocity of the first process gas toward a central region of the substrate;

(a2) supplying the second process gas such that a transfer velocity of the second process gas toward the central region of the substrate is faster than the transfer velocity of the second process gas toward the edge region of the substrate; and

(b) supplying a reactive gas toward the substrate,

wherein, in (a1), in parallel with supplying the first process gas toward the edge region of the substrate from the first gas supplier provided at a central region of a zone beside a periphery of the substrate, an inert gas is supplied toward the edge region of the substrate from the second gas supplier provided at another region of the zone horizontally adjacent to the central region of the zone, and

wherein, in (a2), the second process gas is supplied toward the central region of the substrate from the first gas supplier.

[Claim 18]

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

(a1) supplying a first process gas such that a transfer velocity of the first process gas toward an edge region of a substrate is faster than the transfer velocity of the first process gas toward a central region of the substrate;

(a2) supplying a second process gas such that a transfer velocity of the second process gas toward the central region of the substrate is faster than the transfer velocity of the second process gas toward the edge region of the substrate; and

(b) supplying a reactive gas toward the substrate,

wherein, in (a1), in parallel with supplying the first process gas toward the edge region of the substrate from a first gas supplier provided at a central region of a zone beside a periphery of the substrate, an inert gas is supplied toward the edge region of the substrate from a second

gas supplier provided at another region of the zone horizontally adjacent to the central region of the zone, and

wherein, in (a2), the second process gas is supplied toward the central region of the substrate from the first gas supplier.

[Claim 19]

A method of manufacturing a semiconductor device comprising the substrate processing method of claim 9.

[Claim 20]

A substrate processing apparatus comprising:

a substrate retainer configured to support a substrate;

a first gas supplier through which a first process gas is supplied to the substrate supported by the substrate retainer;

a second gas supplier through which a second process gas is supplied to the substrate supported by the substrate retainer; and

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

(a1) supplying the first process gas such that a transfer velocity of the first process gas toward an edge region of the substrate is faster than the transfer velocity of the first process gas toward a central region of the substrate;

(a2) supplying the second process gas such that a transfer velocity of the second process gas toward the central region of the substrate is faster than the transfer velocity of the second process gas toward the edge region of the substrate; and

(b) supplying a reactive gas toward the substrate,

wherein, in (a1), in parallel with supplying the first process gas toward the edge region of the substrate from a central region of a zone beside a periphery of the substrate, an inert gas is

supplied toward the edge region of the substrate from another region of the zone horizontally adjacent to the central region of the zone, and

wherein, in (a2), the second process gas is supplied toward the central region of the substrate through the central region of the zone beside the periphery of the substrate.

[Claim 21]

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

(a1) supplying a first process gas such that a transfer velocity of the first process gas toward an edge region of a substrate is faster than the transfer velocity of the first process gas toward a central region of the substrate;

(a2) supplying a second process gas such that a transfer velocity of the second process gas toward the central region of the substrate is faster than the transfer velocity of the second process gas toward the edge region of the substrate; and

(b) supplying a reactive gas toward the substrate,

wherein, in (a1), in parallel with supplying the first process gas toward the edge region of the substrate from a central region of a zone beside a periphery of the substrate, an inert gas is supplied toward the edge region of the substrate from another region of the zone horizontally adjacent to the central region of the zone, and

wherein, in (a2), the second process gas is supplied toward the central region of the substrate through the central region of the zone beside the periphery of the substrate.