[CLAIMS]

[Claim 1]

A substrate processing apparatus comprising:

a reaction tube in which a substrate is accommodated;

a process gas supplier through which a process gas is supplied into the reaction tube;

an exhauster through which the process gas is exhausted from the reaction tube;

an exhaust gas process chamber connected to the exhauster and in which the exhausted process gas is subject to a process;

a first inert gas supply source configured to be capable of supplying a first inert gas not only to the exhaust gas process chamber but also to the reaction tube;

a first inert gas supplier connected to the first inert gas supply source and through which the first inert gas is supplied to the exhaust gas process chamber;

a second inert gas supply source configured to be capable of supplying a second inert gas to the exhaust gas process chamber;

a second inert gas supplier connected to the second inert gas supply source and through which the second inert gas is supplied to the exhaust gas process chamber;

an exhaust pipe through which a gas in the exhaust gas process chamber is exhausted; and

a controller configured to be capable of controlling the first inert gas supplier and the second inert gas supplier such that the first inert gas is supplied to the reaction tube and the exhaust gas process chamber separately from the first inert gas supply source while the process gas is subject to the process in the exhaust gas process chamber and the second inert gas is supplied to the exhaust gas process chamber through the second inert gas supplier when the process in the exhaust gas process chamber is stopped,

wherein the first inert gas supply source is connected to the reaction tube, and

connected via the first inert gas supplier to the exhaust gas process chamber.

[Claim 2]

The substrate processing apparatus of claim 1, wherein the exhaust gas process chamber is provided with a detector configured to detect a process state in the exhaust gas process chamber, and

wherein the controller is further configured to be capable of determining whether the process is stopped based on data detected by the detector.

[Claim 3]

The substrate processing apparatus of claim 2, wherein the controller is further configured to be capable of controlling the first inert gas supplier and the second inert gas supplier such that the second inert gas is supplied in addition to a supply of the first inert gas after it is determined that the process in the exhaust gas process chamber is stopped.

[Claim 4]

The substrate processing apparatus of claim 2, wherein the controller is further configured to be capable of controlling the first inert gas supplier and the second inert gas supplier such that a flow rate of the second inert gas is greater than a flow rate of the first inert gas when the second inert gas is supplied to the exhaust gas process chamber through the second inert gas supplier after it is determined that the process in the exhaust gas process chamber is stopped.

[Claim 5]

The substrate processing apparatus of claim 2, wherein the exhaust gas process

chamber, the first inert gas supplier and the second inert gas supplier are connected by a three-way valve, and

wherein the controller is further configured to be capable of controlling the three-way valve when it is determined that the process in the exhaust gas process chamber is stopped.

[Claim 6]

The substrate processing apparatus of claim 1, wherein the controller is further configured to be capable of calculating flow rate data of the second inert gas based on a flow rate of the process gas supplied through the process gas supplier.

[Claim 7]

The substrate processing apparatus of claim 1, wherein the controller is further configured to be capable of calculating flow rate data of the second inert gas based on a flow rate of the process gas supplied through the process gas supplier and characteristic data of the process gas.

[Claim 8]

The substrate processing apparatus of claim 6, wherein the controller is further configured to be capable of setting a flow rate of a flow rate regulator capable of controlling a flow rate of the second inert gas based on the flow rate data of the second inert gas.

[Claim 9]

The substrate processing apparatus of claim 6, further comprising

an input/output device configured to input and output data,

wherein the controller is further configured to be capable of transmitting a message

corresponding to the flow rate data of the second inert gas to the input/output device.

[Claim 10]

The substrate processing apparatus of claim 1, wherein the second inert gas supplier is provided with a flow rate regulator capable of controlling a flow rate of the second inert gas to be equal to a predetermined flow rate.

[Claim 11]

The substrate processing apparatus of claim 2, further comprising:

a bypass exhaust pipe connected to an exhaust equipment and connected to the exhauster upstream of the exhaust gas process chamber;

a first valve provided at the exhauster upstream of the exhaust gas process chamber and downstream of a location where the bypass exhaust pipe is connected to the exhauster; and

a second valve provided at the bypass exhaust pipe,

wherein the controller is further configured to be capable of controlling the first valve and the second valve such that the first valve is closed and the second valve is opened after it is determined that the process in the exhaust gas process chamber is stopped.

[Claim 12]

A substrate processing method comprising:

(a) accommodating a substrate in a reaction tube;

(b) supplying a process gas into the reaction tube;

(c) exhausting the process gas from the reaction tube;

(d) supplying the process gas exhausted in (c) to an exhaust gas process chamber;

(e) processing the process gas in the exhaust gas process chamber;

(f) at least during (e), supplying a first inert gas into the reaction tube and the exhaust gas process chamber separately from a first inert gas supply source configured to be capable of supplying the first inert gas not only to the exhaust gas process chamber but also to the reaction tube, wherein the first inert gas supply source is connected to the reaction tube, and connected via the first inert gas supplier to the exhaust gas process chamber; and

(g) after (e) is stopped, supplying a second inert gas to the exhaust gas process chamber from a second inert gas supply source configured to be capable of supplying the second inert gas to the exhaust gas process chamber.

[Claim 13]

A method of manufacturing a semiconductor device, comprising:

(a) accommodating a substrate in a reaction tube;

(b) supplying a process gas into the reaction tube;

(c) exhausting the process gas from the reaction tube;

(d) supplying the process gas exhausted in (c) to an exhaust gas process chamber;

(e) processing the process gas in the exhaust gas process chamber;

(f) at least during (e), supplying a first inert gas into the reaction tube and the exhaust gas process chamber separately from a first inert gas supply source configured to be capable of supplying the first inert gas not only to the exhaust gas process chamber but also to the reaction tube, wherein the first inert gas supply source is connected to the reaction tube, and connected via the first inert gas supplier to the exhaust gas process chamber; and

(g) after (e) is stopped, supplying a second inert gas to the exhaust gas process chamber from a second inert gas supply source configured to be capable of supplying the second inert gas to the exhaust gas process chamber.

[Claim 14]

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

(a) accommodating a substrate in a reaction tube;

(b) supplying a process gas into the reaction tube;

(c) exhausting the process gas from the reaction tube;

(d) supplying the process gas exhausted in (c) to an exhaust gas process chamber;

(e) processing the process gas in the exhaust gas process chamber;

(f) at least during (e), supplying a first inert gas into the reaction tube and the exhaust gas process chamber separately from a first inert gas supply source configured to be capable of supplying the first inert gas not only to the exhaust gas process chamber but also to the reaction tube, wherein the first inert gas supply source is connected to the reaction tube, and connected via the first inert gas supplier to the exhaust gas process chamber; and

(g) after (e) is stopped, supplying a second inert gas to the exhaust gas process chamber from a second inert gas supply source configured to be capable of supplying the second inert gas to the exhaust gas process chamber.