[CLAIMS]

[Claim 1]

A vaporizer comprising:

a liquid source supplier configured to supply a liquid source;

a vaporization vessel constituting a vaporization chamber in which the liquid source supplied through the liquid source supplier is vaporized;

a first heater configured to heat the vaporization vessel;

a heat insulating material provided to prevent heat emitted from the first heater from transferring to the liquid source supplier;

a second heater configured to heat the liquid source supplier; and

a controller configured to individually control a temperature of the first heater and a temperature of the second heater.

[Claim 2]

The vaporizer of claim 1, wherein the heat insulating material is provided between the first heater and the second heater.

[Claim 3]

The vaporizer of claim 1 or 2, wherein the vaporization vessel comprises:

an outer vessel of a cylindrical shape; and

an inner vessel provided at an inner side of the outer vessel and being of a column shape,

wherein a gap is provided between an outer wall of the inner vessel and an inner wall of the outer vessel to define a flow path of a cylindrical shape in which the liquid source is vaporized, and a width of the flow path is 0.6 mm or more and 0.8 mm or less.

[Claim 4]

The vaporizer of any one of claims 1 through 3, wherein the heat insulating material is configured such that a temperature of the liquid source supplier is 100 °C or lower.

[Claim 5]

The vaporizer of claim 2, wherein the controller is further configured to control the temperature of the second heater such that a temperature of the liquid source supplier is 80 °C or higher and 100 °C or lower.

[Claim 6]

The vaporizer of any one of claims 1 through 5, wherein the liquid source supplier comprises:

an outlet port configured to eject the liquid source into the vaporization chamber; and

a liquid source introducing pipe configured to introduce the liquid source to the outlet port.

[Claim 7]

The vaporizer of claim 6, wherein the liquid source supplier further comprises:

a carrier gas outlet port provided adjacent to the outlet port and configured to eject a carrier gas into the vaporization vessel; and

a carrier gas introducing pipe configured to introduce the carrier gas to the carrier gas outlet port.

[Claim 8]

The vaporizer of any one of claims 1 through 7, wherein the vaporization vessel and the liquid source supplier are formed as a single body made of quartz.

[Claim 9]

A vaporizer comprising:

a liquid source supplier configured to supply a liquid source;

a vaporization vessel constituting a vaporization chamber in which the liquid source supplied through the liquid source supplier is vaporized;

a first heater configured to heat the vaporization vessel;

a heat insulating material provided to prevent heat emitted from the first heater from transferring to the liquid source supplier;

a first metal block inserted between the first heater and the vaporization vessel, and configured to be heated by the first heater and transfer the heat to the vaporization vessel,

wherein the heat insulating material is configured to cover at least a part of a

surface of the first metal block so as to prevent the heat emitted from the first metal block from transferring to the liquid source supplier.

[Claim 10]

The vaporizer of claim 9, wherein the vaporization vessel comprises an outer vessel of a cylindrical shape, and

the first metal block is provided so as to cover an outer surface of the outer vessel from below the outer vessel to a height position same as a ceiling wall of the vaporization vessel connected to the liquid source supplier, or from below the outer vessel to a height position lower than the ceiling wall.

[Claim 11]

The vaporizer of claim 9 or 10, further comprising:

a second heater configured to heat the liquid source supplier; and

a second metal block inserted between the second heater and the liquid source supplier, and configured to be heated by the second heater and transfer the heat to the liquid source supplier,

wherein the heat insulating material is provided between the first metal block and the second metal block.

[Claim 12]

The vaporizer of any one of claims 1 through 11, wherein the liquid source contains hydrogen peroxide.

[Claim 13]

A substrate processing apparatus comprising:

a process chamber in which a substrate is processed;

a vaporizer comprising:

a liquid source supplier configured to supply a liquid source;

a vaporization vessel constituting a vaporization chamber in which the liquid source supplied through the liquid source supplier is vaporized;

a first heater configured to heat the vaporization vessel;

a heat insulating material provided to prevent heat emitted from the first heater from transferring to the liquid source supplier;

a second heater configured to heat the liquid source supplier; and

a controller configured to individually control a temperature of the first heater and a temperature of the second heater; and

a vaporized gas pipe configured to supply a vaporized gas generated by the vaporizer into the process chamber.

[Claim 14]

A method of manufacturing a semiconductor device comprising:

(a) loading a substrate into a process chamber;

(b) supplying a liquid source into a vaporization vessel constituting a vaporization chamber in which the liquid source supplied by a liquid source supplier configured to supply the liquid source is vaporized;

(c) heating the vaporization vessel by a first heater configured to heat the vaporization vessel while preventing heat emitted from the first heater from transferring to the liquid source supplier by a heat insulating material and heating the liquid source supplier by a second heater configured to heat the liquid source supplier; and

(d) generating a vaporized gas by vaporizing the liquid source supplied into the heated vaporization vessel and supplying the vaporized gas into the process chamber,

wherein a temperature of the first heater and a temperature of the second heater are respectively controlled.