Claims

[Claim 1]

A method for producing trichlorosilane, the method comprising:

reacting metallic silicon and tetrachlorosilane with a mixed gas containing hydrogen to generate trichlorosilane, wherein

the mixed gas containing hydrogen contains 1 to 500 molar ppm of hydrogen chloride and 100 to 10000 molar ppm of silane hydride,

a molar ratio (silane hydride/ hydrogen chloride) of the silane hydride to the hydrogen chloride in the mixed gas containing hydrogen ranges from 1.0 to 100, and

the mixed gas is heated at 100°C to 450°C and then reacted.

[Claim 2]

The method for producing trichlorosilane according to claim 1, wherein

the mixed gas is held for at least 3 seconds at 100°C to 450°C and then reacted.

[Claim 3]

The method for producing trichlorosilane according to claim 1, wherein

the mixed gas is mixed with tetrachlorosilane, and then the mixed gas containing the tetrachlorosilane is heated at 100°C to 450°C.

[Claim 4]

The method for producing trichlorosilane according to claim 1, wherein

the mixed gas contains an exhaust gas obtained by condensing and separating trichlorosilane from a reaction product gas containing the trichlorosilane obtained by reacting metallic silicon with hydrogen chloride to generate the trichlorosilane.

[Claim 5]

The method for producing trichlorosilane according to claim 1, wherein

the mixed gas contains an exhaust gas obtained by condensing and separating trichlorosilane from a reaction product gas containing the trichlorosilane obtained by

reacting metallic silicon and tetrachlorosilane with hydrogen to generate the trichlorosilane.

[Claim 6]

The method for producing trichlorosilane according to claim 1, wherein

the mixed gas contains an exhaust gas obtained by condensing and separating trichlorosilane from an exhaust gas obtained by reacting the trichlorosilane with hydrogen to generate polycrystalline silicon.

[Claim 7]

A method for producing trichlorosilane, the method comprising:

obtaining a reaction product gas containing trichlorosilane by the production method according to any one of claims 1 to 6, and then condensing and separating the trichlorosilane from the reaction product gas.

[Claim 8]

A method for producing a polycrystalline silicon rod, the method comprising:

using a reaction furnace having a structure in which

an interior is sealed with a bell jar and a bottom plate,

the bottom plate is provided with an electrode pair for holding a plurality of silicon core wires and energizing the silicon core wires, and

a plurality of gas supply nozzles for supplying a raw material gas for silicon deposition to an internal space of the bell jar are provided; and

ejecting the raw material gas for silicon deposition from the gas supply nozzles while energizing the silicon core wires to deposit polycrystalline silicon on the silicon core wires, wherein

the raw material gas for silicon deposition contains the trichlorosilane obtained by the production method according to claim 7.