Claims

[Claim 1]

A treatment liquid for cleaning a semiconductor wafer, comprising:

(A) a hypochlorite ion;

(B1) an alkyl ammonium ion; and

(C) a solvent, wherein

a concentration of the (A) hypochlorite ion is 0.05 mass% to 6 mass%, and pH at 25°C is more than 7 and less than 12.0.

[Claim 2]

The treatment liquid according to claim 1, wherein a concentration of the (A) hypochlorite ion is 0.1 mass% to 6 mass%.

[Claim 3]

The treatment liquid according to claim 2, wherein a concentration of the (A) hypochlorite ion is 0.3 mass% to 6 mass%.

[Claim 4]

A treatment liquid for cleaning a semiconductor wafer, comprising:

(A) a hypochlorite ion;

(B1) an alkyl ammonium ion; and

(C) a solvent, wherein

the solvent (C) contains an organic solvent, and pH at 25°C is 8 or more and less than 12.0.

[Claim 5]

The treatment liquid according to claim 4, wherein a concentration of the (A) hypochlorite ion is 0.05 mass% to 20.0 mass%.

[Claim 6]

The treatment liquid according to claim 1, wherein the (B1) alkyl ammonium ion is a quaternary alkyl ammonium ion.

[Claim 7]

The treatment liquid according to claim 4, wherein the (B1) alkyl ammonium ion is a quaternary alkyl ammonium ion.

[Claim 8]

A method for cleaning a semiconductor wafer, wherein the treatment liquid according to claim 1 is brought into contact with the semiconductor wafer.

[Claim 9]

A method for cleaning a semiconductor wafer, wherein the treatment liquid according to claim 4 is brought into contact with the semiconductor wafer.

[Claim 10]

The method for cleaning a semiconductor wafer according to claim 8, wherein the semiconductor wafer has at least one metal selected from the group consisting of ruthenium and tungsten on a surface thereof, and the method includes a step of removing the metal.

[Claim 11]

The method for cleaning a semiconductor wafer according to claim 9, wherein the semiconductor wafer has at least one metal selected from the group consisting of ruthenium and tungsten on a surface thereof, and the method includes a step of removing the metal.

[Claim 12]

A method for manufacturing the treatment liquid according to claim 1, comprising:

(a) preparing an ion exchange resin to which alkyl ammonium is added; and

(b) bringing the ion exchange resin to which the alkyl ammonium is added into contact with an aqueous solution

containing a hypochlorite ion.

[Claim 13]

A method for manufacturing the treatment liquid according to claim 4, comprising:

(a) preparing an ion exchange resin to which alkyl ammonium is added; and

(b) bringing the ion exchange resin to which the alkyl ammonium is added into contact with an aqueous solution containing a hypochlorite ion.

[Claim 14]

The method for manufacturing the treatment liquid according to claim 12, comprising (c) adjusting pH after the (b).

[Claim 15]

The method for manufacturing the treatment liquid according to claim 13, comprising (c) adjusting pH after the (b).