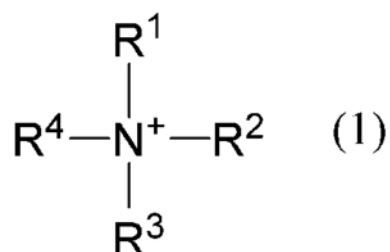


CLAIMS

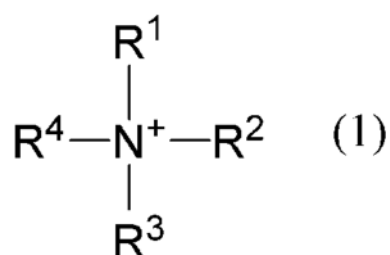
1. A treatment liquid for treating a semiconductor wafer in a semiconductor formation process; the treatment liquid comprising:
 - (A) hypochlorite ion;
 - (B) a pH buffer; and
 - (C) a tetraalkylammonium ion represented by the following formula (1):



, wherein the pH buffer (B) has a concentration of from 0.0001 to 10 mass%, wherein each of R¹, R², R³ and R⁴ is independently an alkyl group having carbon number from 1 to 20.

2. The treatment liquid according to claim 1, wherein R¹, R², R³ and R⁴ in the formula (1) are the same alkyl group having carbon number from 1 to 3.
3. The treatment liquid according to claim 1 or 2, wherein each of R¹, R², R³ and R⁴ in the formula (1) is a methyl group.
4. The treatment liquid according to any one of claims 1 to 3, wherein the pH buffer (B) is at least one selected from the group consisting of: carbonic acid, boric acid, phosphoric acid, tris(hydroxymethyl)aminomethane(tris), ammonia, pyrophosphoric acid, p-phenolsulfonic acid, diethanolamine, ethanolamine, triethanolamine, 5,5-diethylbarbituric acid, glycine, glycyglycine, imidazole, N,N-bis(2-hydroxyethyl)-2-aminoethanesulfonic acid, 3-morpholinopropanesulfonic acid, N-tris(hydroxymethyl)methyl-2-aminoethanesulfonic acid, 2-[4-(2-hydroxyethyl)-1-piperazinyl]ethanesulfonic acid, 4-(2-hydroxyethyl)-1-piperazinepropanesulfonic acid, tricine, N,N-di(2-hydroxyethyl)glycine, 2-cyclohexylaminoethanesulfonic acid, hydroxyproline, phenol and ethylenediaminetetraacetic acid.

5. The treatment liquid according to any one of claims 1 to 4, wherein a concentration of the hypochlorite ion (A) is from 0.05 to 20.0 mass%.
6. The treatment liquid according to any one of claims 1 to 5, wherein a pH at 25°C of the treatment liquid is 7 or more and less than 14.
7. The treatment liquid according to any one of claims 1 to 6, wherein the pH buffer (B) is at least one selected from the group consisting of carbonic acid, boric acid and phosphoric acid.
8. An etching method comprising the step of bringing the treatment liquid according to any one of claims 1 to 7 into contact with a semiconductor wafer.
9. The etching method according to claim 8, wherein a metal contained in the semiconductor wafer is ruthenium, and wherein the ruthenium is etched.
10. A method for inhibiting the generation of a ruthenium-containing gas, the method comprising using an inhibitor for inhibiting the generation of a ruthenium-containing gas; wherein, ~~An inhibitor for inhibiting the generation of a ruthenium-containing gas,~~ the inhibitor comprising the following (B) and (C):
 (B) a pH buffer; and
 (C) a tetraalkylammonium ion represented by the following formula (1):



wherein each of R¹, R², R³ and R⁴ is independently an alkyl group having carbon number from 1 to 20.

11. The method for inhibiting the generation of a ruthenium-containing inhibitor for inhibiting the generation of a ruthenium-containing gas according to claim 10, the

inhibitor further comprising (A) hypochlorite ion.

12. The method for inhibiting the generation of a ruthenium-containing gas~~inhibitor for inhibiting the generation of a ruthenium-containing gas~~ according to claim 10 or 11, wherein a concentration of the tetraalkylammonium ion (C) in the inhibitor is from 0.0001 to 50 mass%.

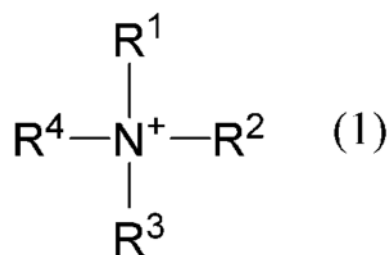
13. The method for inhibiting the generation of a ruthenium-containing gas~~inhibitor for inhibiting the generation of a ruthenium-containing gas~~ according to any one of claims 10 to 12, wherein R¹, R², R³ and R⁴ in the formula (1) are the same alkyl group having carbon number from 1 to 3.

~~14. A method for inhibiting the generation of a ruthenium-containing gas, the method comprising using the inhibitor for inhibiting the generation of a ruthenium-containing gas according to any one of claims 10 to 13.~~

~~15~~14. A method for treating a ruthenium-containing waste liquid, the method comprising using a treatment agent for treating a ruthenium-containing waste liquid~~A treatment agent for treating a ruthenium-containing waste liquid, the treatment agent comprising the following (B) and (C):~~

(B) a pH buffer; and

(C) a tetraalkylammonium ion represented by the following formula (1):



wherein each of R¹, R², R³ and R⁴ is independently an alkyl group having carbon number from 1 to 20.

~~16~~15. The method for treating a ruthenium-containing waste liquid~~treatment agent for~~

~~treating a ruthenium-containing waste liquid according to claim 15~~14, the treatment agent further comprising (A) hypochlorite ion.

~~17~~16. The method for treating a ruthenium-containing waste liquid~~treatment agent for treating a ruthenium-containing waste liquid~~ according to claim ~~15~~14 or ~~16~~15, wherein a concentration of the tetraalkylammonium ion (C) in the treatment agent is from 0.0001 to 50 mass %.

~~18~~17. The method for treating a ruthenium-containing waste liquid ~~treatment agent for treating a ruthenium-containing waste liquid~~ according to any one of claims ~~15~~14 to ~~17~~16, wherein R^1 , R^2 , R^3 and R^4 in the formula (1) are the same alkyl group having carbon number from 1 to 3.

~~19.~~—A method for treating a ruthenium-containing waste liquid, the method comprising using the treatment agent for treating a ruthenium-containing waste liquid according to any one of claims ~~15 to 18~~.