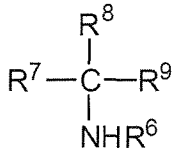
(trishydroxymethylaminomethane), monopentanolamine, 2-amino-2-ethyl-1,3-propanediol, monohexanolamine, monoheptanolamine, monooctanolamine, mononononanolamine, monodecanolamine; (4) the secondary monoamine having two hydroxyalkyl groups having 1 to 10 carbon atoms, such as, for example, diethanolamine, dipropanolamine, dibutanolamine, dipentanolamine, dihexanolamine, diheptanolamine, dioctanolamine, dinonanolamine, didecanolamine; and (5) the secondary monoamine having one alkyl group having 1 to 10 carbon atoms and one hydroxyalkyl group having 1 to 10 carbon atoms, such as, for example, monomethylmonoethanolamine, monoethylmonoethanolamine, monopropylmonopropanolamine, monobutylmonobutanolamine, monopentylmonopentanolamine, monohexylmonohexanolamine, monoheptylmonoheptanolamine, ~~monoheptylmonoheptanolamine,~~ monooctylmonooctanolamine, mononononylmononononanolamine, monodecylmonodecanolamine, 3-methylamino-1,2-propanediol. It should be noted that, as these primary or secondary monoamines, one kind thereof may be used alone, or two or more kinds may be used in combination.

[0038]

Among these primary or secondary monoamines, (3) the primary monoamine having one hydroxyalkyl group having 1 to 10 carbon atoms, such as, for example, monoethanolamine, mono-n-propanolamine, 2-amino-2-methyl-1-propanol, 3-amino-1,2-propanediol (2,3-dihydroxypropylamine), 2-amino-1,3-propanediol, mono-n-butanolamine, 2-amino-2-methyl-1,3-propanediol, 2-amino-2-hydroxymethyl-1,3-propanediol (trishydroxymethylaminomethane), monopentanolamine, 2-amino-2-ethyl-1,3-propanediol, monohexanolamine, monoheptanolamine, monooctanolamine, mononononanolamine, monodecanolamine; (4) the secondary monoamine having two hydroxyalkyl groups having 1 to 10 carbon atoms, such as, for example, diethanolamine, dipropanolamine, dibutanolamine, dipentanolamine, dihexanolamine,

diheptanolamine, dioctanolamine, dinonanolamine, didecanolamine; and (5) the secondary monoamine having one alkyl group having 1 to 10 carbon atoms and one hydroxyalkyl group having 1 to 10 carbon atoms, such as, for example, monomethylmonoethanolamine, monoethylmonoethanolamine, monopropylmonopropanolamine, monobutylmonobutanolamine, monopentylmonopentanolamin, monohexylmonohexanolamine, monoheptylmonoheptanolamine, ~~monoheptylmonoheptanolamine,~~ monooctylmonooctanolamine, monononylmononononanolamine, monodecylmonodecanolamine, 3-methylamino-1,2-propanediol are preferable; and among them, the primary or secondary monoamine represented by the following general formula [5] is preferable. The primary or secondary monoamine having one or two alkyl group having 1 to 10 carbon atoms, has higher volatility, as compared with the primary or secondary monoamine having one or two hydroxyalkyl group having carbon 1 to 10 atoms, and thus tends to change compositional ratio of the cleaning agent, while continuing using the cleaning agent for the semiconductor substrate of the present invention. Therefore, it is preferable to use the primary or secondary monoamine having one or two hydroxyalkyl group having 1 to 10 carbon atoms, which little changes compositional ratio of the cleaning agent, even in the case of continuing using the cleaning agent for the semiconductor substrate of the present invention, and has low volatility. Further, among these primary or secondary monoamines, a primary or secondary monoamine represented by the following general formula [5] is more preferable in view of having low corrosion property to tungsten and superior removal performance of the polishing fines (particle).

[0039]



[5]

(wherein R^6 and R^9 each independently represent a hydrogen atom, an alkyl