CLAIMS

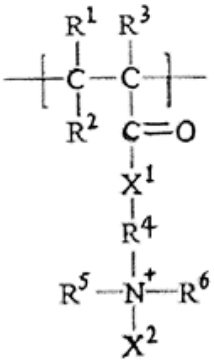
[1] A polishing liquid composition for a silicon oxide film, comprising:

cerium oxide particles;

a water-soluble macromolecular compound; and

an aqueous medium,

wherein the water-soluble macromolecular compound is a water-soluble macromolecular compound containing a constitutional unit *a* represented by Formula (1):



(1)

where

R^1 to R^3 are the same as or different from each other and represent a hydrogen atom, a methyl group, or an ethyl group,

R^4 represents $-Y^1-OPO_3^--Y^2-$,

Y^1 and Y^2 are the same as or different from each other and represent an alkylene group having 1 to 4 carbon atoms,

R^5 and R^6 are the same as or different from each other and represent a hydrocarbon group having 1 to 4 carbon atoms,

X^1 represents O or NR^7,

R^7 represents a hydrogen atom or a hydrocarbon group having 1 to 4 carbon atoms,

X^2 represents a hydrocarbon group having 1 to 4 carbon atoms.

[2] The polishing liquid composition for a silicon oxide film according to claim 1, wherein the water-soluble macromolecular compound is a water-soluble

macromolecular compound including a phosphobetaine structure.

[3] The polishing liquid composition for a silicon oxide film according to claim 1 or 2, further comprising an anionic macromolecular compound.

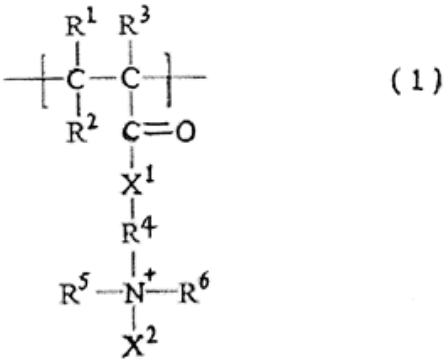
[4] A polishing liquid kit for preparing a polishing liquid composition for a silicon oxide film, comprising:

a first liquid obtained by dispersing cerium oxide particles in an aqueous medium; and

a second liquid that is contained in a container separate from a container containing the first liquid and contains an aqueous medium,

wherein one or both of the first liquid and the second liquid further contains a water-soluble macromolecular compound, and

the water-soluble macromolecular compound is a water-soluble macromolecular compound containing a constitutional unit *a* represented by Formula (1):



(1)

where

R^1 to R^3 are the same as or different from each other and represent a hydrogen atom, a methyl group, or an ethyl group,

R^4 represents $-Y^1-OPO_3^-Y^2-$,

Y^1 and Y^2 are the same as or different from each other and represent an alkylene group having 1 to 4 carbon atoms,

R^5 and R^6 are the same as or different from each other and represent a hydrocarbon group having 1 to 4 carbon atoms,

X^1 represents O or NR^7,

R^7 represents a hydrogen atom or a hydrocarbon group having 1 to 4 carbon atoms,

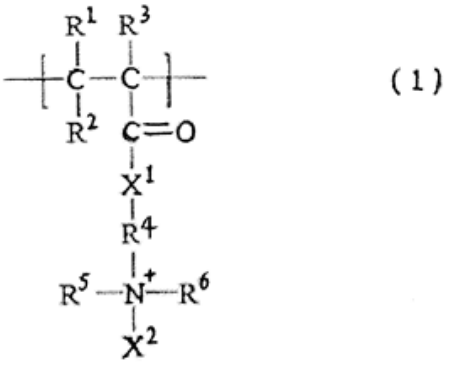
X^2 represents a hydrocarbon group having 1 to 4 carbon atoms.

[5] An additive composition for silicon oxide film polishing to be used together with a dispersion liquid obtained by dispersing cerium oxide particles in an aqueous medium, comprising:

an aqueous medium; and

a water-soluble macromolecular compound dissolved in the aqueous medium,

wherein the water-soluble macromolecular compound is a water-soluble macromolecular compound containing a constitutional unit *a* represented by Formula (1):



(1)

where

R^1 to R^3 are the same as or different from each other and represent a hydrogen atom, a methyl group, or an ethyl group,

R^4 represents $-Y^1-OPO_3^--Y^2-$,

Y^1 and Y^2 are the same as or different from each other and represent an alkylene group having 1 to 4 carbon atoms,

R^5 and R^6 are the same as or different from each other and represent a hydrocarbon group having 1 to 4 carbon atoms,

X^1 represents O or NR^7,

R^7 represents a hydrogen atom or a hydrocarbon group having 1 to 4 carbon atoms,

X^2 represents a hydrocarbon group having 1 to 4 carbon atoms.

[6] A method for manufacturing a semiconductor device, comprising a step of polishing a silicon oxide film using the polishing liquid composition for a silicon oxide film according to any one of claims 1 to 3.

[7] A method for polishing a silicon oxide film, comprising a step of polishing a silicon oxide film using the polishing liquid composition for a silicon oxide film according to any one of claims 1 to 3,

wherein the silicon oxide film is an insulating film formed in a process for manufacturing a semiconductor device.