# CLAIMS

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

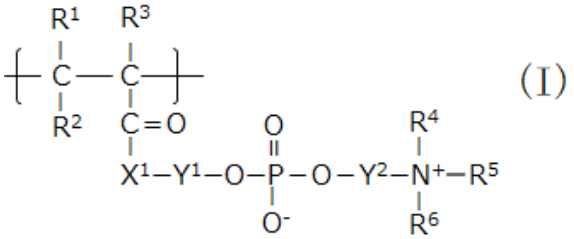
cerium oxide particles (component A);

a water-soluble polymer (component B);

an anionic condensate (component C); and

an aqueous medium,

wherein the component B is a polymer containing a constitutional unit b1 represented by the following formula (I), and the constitutional unit b1 is a constitutional unit derived from a monomer containing a methacryloyloxyethyl phosphobetaine structure,

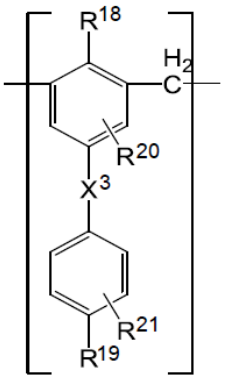


(I)

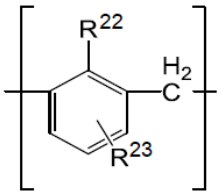
where $R^1$, $R^2$, $R^3$, $R^4$, $R^5$, and $R^6$ are the same or different and represent a hydrogen atom, a methyl group, or an ethyl group, $X^1$ represents O or NH, and $Y^1$ and $Y^2$ are the same or different and represent an alkylene group having 1 to 4 carbon atoms,

wherein the component C is a condensate containing a constitutional unit with a structure derived from an aromatic monomer having an anionic group, and

the component C further contains at least one selected from the group consisting of a constitutional unit c1 represented by the following formula (V) and a constitutional unit c2 represented by the following formula (VI):

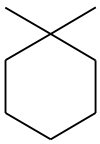


(V)



(VI)

where $R^{18}$ and $R^{19}$ are the same or different and represent a hydrogen atom or $–OM^1$, $M^1$ represents at least one selected from the group consisting of alkali metal, alkaline earth metal, organic cation, ammonium, and a hydrogen atom, $R^{20}$ and $R^{21}$ are the same or different and represent a hydrogen atom, an alkyl group, an alkoxy group, an aralkyl group, or $–OM^2$, $M^2$ represents at least one selected from the group consisting of alkali metal, alkaline earth metal, organic cation, ammonium, and a hydrogen atom, and $X^3$ represents a bond, $–CH_2–$, –S–, $–SO_2–$, $–C(CH_3)_2–$, or

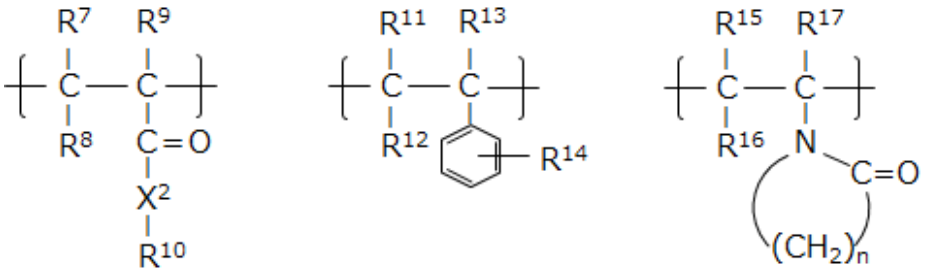


,

where $R^{22}$ represents a hydrogen atom or $–OM^3$, $M^3$ represents at least one selected from the group consisting of alkali metal, alkaline earth metal, organic cation, ammonium, and a hydrogen atom, $R^{23}$ represents a hydrogen atom, an alkyl group, an alkoxy group, an aralkyl group, or $–OM^4$, and $M^4$ represents at least one selected from the group consisting of alkali metal, alkaline earth metal, organic cation, ammonium, and a hydrogen atom.

2. The polishing liquid composition according to claim 1, wherein the component B is a copolymer containing the constitutional unit b1 represented by the formula (I) and at least one constitutional unit b2

selected from the group consisting of a constitutional unit represented by the following formula (II), a constitutional unit represented by the following formula (III), and a constitutional unit represented by the following formula (IV):



(II) (III) (IV)

where $R^7$, $R^8$, and $R^9$ are the same or different and represent a hydrogen atom, a methyl group, or an ethyl group, $X^2$ represents O or NH, and $R^{10}$ represents a hydrocarbon group,

where $R^{11}$, $R^{12}$, and $R^{13}$ are the same or different and represent a hydrogen atom, a methyl group, or an ethyl group and $R^{14}$ represents a hydrogen atom, a hydroxyl group, a hydrocarbon group, or an alkoxy group,

where $R^{15}$, $R^{16}$, and $R^{17}$ are the same or different and represent a hydrogen atom, a methyl group, or an ethyl group and n represents an integer of 2 to 12.

3. The polishing liquid composition according to claim 1, wherein the component B is a homopolymer composed of the constitutional unit b1 represented by the formula (I).

4. The polishing liquid composition according to any one of claims 1 to 3, wherein the constitutional unit with a structure derived from an aromatic monomer having an anionic group has a structure in which at least one hydrogen atom of the aromatic ring in the main chain is substituted with a sulfonic acid group.

5. The polishing liquid composition according to any one of claims 1 to 4, wherein a content of the component C is 0.001% by mass or more and 1% by mass or less.

6. The polishing liquid composition according to any one of claims 1 to 5, wherein a mass ratio B/C of the component B to the component C is 0.1 or more and 20 or less.

7. The polishing liquid composition according to any one of claims 1 to 6, wherein a molecular weight of the component C is 6,000 or less.

8. The polishing liquid composition according to any one of claims 1 to 7, wherein a content of the component A is 0.001% by mass or more and 10% by mass or less.

9. The polishing liquid composition according to any one of claims 1 to 8, further comprising a compound (component D) having a group represented by the following formula (VII):

$$-[(CHX)_p-O]_q- \quad \text{(VII)}$$

where X represents a hydrogen atom or OH, p represents a number of 2 or more and 5 or less, and q represents a number of 5 or more and 10,000 or less, in which if p is 2 or more, X's are the same or different.

10. The polishing liquid composition according to claim 9, wherein the component D is polyethylene glycol or polyglycerol.

11. A method for producing a semiconductor substrate, comprising:

polishing a film to be polished with the polishing liquid composition according to any one of claims 1 to 10.

12. A polishing method comprising:

polishing a film to be polished with the polishing liquid composition according to any one of claims 1 to 10.