We Claim:

1. An aqueous polishing composition having a pH in the range of from 3 to 11 and comprising

(A) at least one type of abrasive particles which are positively charged when dispersed in an aqueous medium free from component (B) and having a pH in the range of from 3 to 9 as evidenced by the electrophoretic mobility;

(B) at least one anionic phosphate dispersing agent; and

(C) at least least one polyhydric alcohol component selected from the group consisting of

(c1) polyhydric alcohols selected from the group consisting of water-soluble and water-dispersible, aliphatic and cycloaliphatic, monomeric, dimeric and oligomeric polyols having at least 4 hydroxy groups that are not dissociable in the aqueous medium;

(c2) a mixture consisting of

(c21) at least one one polyhydric alcohol selected from the group consisting of water-soluble and water-dispersible, aliphatic and cycloaliphatic polyols having at least 2 hydroxy groups that are not dissociable in the aqueous medium; and

(c22) at least one water-soluble or water-dispersible polymer selected from the group consisting of linear and branched alkylene oxide homopolymers and copolymers (c221); and linear and branched, aliphatic and cycloaliphatic poly(N-vinylamide) homopolymers and copolymers (c222); and

(c3) mixtures of (c1) and (c2).

2. The aqueous polishing composition according to claim 1, characterized in that the abrasive particles (A) are inorganic particles.

3. The aqueous polishing composition according to claim 1 or 2, characterized in that the inorganic abrasive particles (A) contain or consist of ceria and have an average particle diameter of from 1 to 1000 nm as measured by dynamic laser light scattering.

4. The aqueous polishing composition according to anyone of the claims 1 to 3, characterized in that the anionic phosphate dispersing agent (B) is selected from the group of water-soluble condensed phosphates.

5. The aqueous polishing composition according to claim 4, characterized in that the water-soluble condensed phosphate (B) is selected from the group consisting of metaphosphates of the general formula I:

$[M^{+}_{n}(PO_3)_n]$ (I);

and polyphosphates of the general formula II and III:

$M^{+}_{n}P_nO_{3n+1}$ (II);

$M^{+}H_2P_nO_{3n+1}$ (III);

wherein M is ammonium, sodium and potassium and the index n is from 2 to 10,000.

6. The aqueous polishing composition according to anyone of the claims 1 to 5, characterized in that the water-soluble and water-dispersible, aliphatic and cycloaliphatic, monomeric, dimeric and oligomeric polyols (c1) having at least 4 hydroxy groups that are not dissociable in the aqueous medium are selected from the group consisting erythritol, pentaerythritol, alditols, cyclitols, carbohydrates and dimers and oligomers of glycerol, erythritol, pentaerythritol, alditols, cyclitols.

7. The aqueous polishing composition according to claim 6, characterized in that the alditol (c1) is selected from the group consisting of tetritols, pentitols, hexitols, heptitols, and octitols; the cyclitol (c1) is selected from inositols; and the carbohydrate (c1) is selected from the group consisting of monosaccharides, disaccharides, oligosaccharides, polysaccharides, desoxy sugars and amino sugars.

8. The aqueous polishing composition according to claim 7, characterized in that the monosaccharide (c1) is selected from the group consisting of allose, altrose, glucose, mannose, idose, galactose and talose.

9. The aqueous polishing composition according to anyone of the claims 1 to 8, characterized in that the water-soluble or water-dispersible, aliphatic or cycloaliphatic polyol (c21) having 2 to 3 hydroxy groups that are not dissociable in the aqueous medium is selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol, triethylene glycol, dipropylene glycol, tripropylene glycol, ethylene propylene glycol, diethylene propylene glycol, ethylene dipropylene glycol, glycerol, 1,2,3-trihydroxy-n-butane, trimethylolpropane, and mixtures thereof; in that the water-soluble or water-dispersible, linear or branched alkylene oxide homopolymer or copolymer (c221) is selected from the group consisting of ethyleneoxide and propyleneoxide homopolymers and copolymers; and that the linear or branched, aliphatic or cycloaliphatic poly(N-vinylamide) homopolymer or copolymer (c222) is selected from the group consisting of homopolymers and copolymers of aliphatic and

cycloaliphatic N-vinylamide monomers selected from the group consisting of N-vinylacetamide, N-vinylpyrrolidone, N-vinylvalerolactam, N-vinylcaprolactam, N-vinylsuccinimide and mixtures thereof.

10. The aqueous polishing composition according to anyone of the claims 1 to 9, characterized in that it contains at least one pH-adjusting agent or buffering agent (E) different from the components (A), (B) and (C).

11. The aqueous polishing composition according to anyone of the claims 1 to 10, characterized in that it contains at least one functional component (D) different from the components (A), (B) and (C).

12. The aqueous polishing composition according to claim 11, characterized in that the functional component (D) is selected from the group consisting of organic, inorganic and hybrid organic-inorganic abrasive particles being different from the particles (A), materials having a lower critical solution temperature LCST or an upper critical solution temperature UCST, oxidizing agents, passivating agents, charge reversal agents, complexing or chelating agents, frictive agents, stabilizing agents, rheology agents, surfactants, biocides, metal cations and organic solvents.

13. The aqueous polishing composition according to claim 12, characterized in that the biocide (D) is selected from the group consisting of water-soluble or water-dispersible N-substituted diazenium dioxides and N'-hydroxy-diazenium oxide salts.

14. A process for polishing substrates for electrical, mechanical and optical devices by contacting the substrate at least once with an aqueous polishing composition and polishing the substrate until the desired planarity is achieved, characterized in that the aqueous polishing composition according to anyone of the claims 1 to 13 is used.

15. The process according to claim 14, characterized in that the substrate comprises at least one layer containing or consisting of at least one dielectric silicon oxide material and at least one layer containing or consisting of silicon nitride.

16. The process according to claim 15, characterized in that its oxide-to-nitride selectivity is greater than 50.

17. The process according to anyone of the claims 13 to 16, characterized in that the electrical devices are integrated circuit devices, liquid crystal panels, organic electroluminescent panels, printed circuit boards, micro machines, DNA chips, micro plants and magnetic heads; the mechanical devices are high precision mechanical devices; and the optical devices are optical glasses such as photo-masks, lenses and prisms, inorganic electro-conductive films such as indium tin oxide (ITO), optical integrated circuits, optical switching elements, optical waveguides, optical monocrystals

such as the end faces of optical fibers and scintillators, solid laser monocrystals, sapphire substrates for blue laser LEDs, semiconductor monocrystals, and glass substrates for magnetic disks.

18. The process according to claim 17, characterized in that the integrated circuit devices contain integrated circuits with large-scale integration or very-large-scale integration, having structures with dimensions below 50 nm.

19. The use of the aqueous polishing composition according to anyone of the claims 1 to 13 for manufacturing electrical, mechanical and optical devices.

Claims

1. An invention not claimed in any divisional application.