We Claim:

1. An aqueous polishing composition has been found, the said aqueous polishing composition comprising

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

(B) at least one water-soluble polymer selected from the group consisting of linear and branched alkylene oxide homopolymers and copolymers; and

(C) at least one anionic phosphate dispersing agent.

2. The aqueous polishing composition according to claim 1, characterized in that the abrasive particles (A) contain or consist of ceria.

3. The aqueous polishing composition according to claim 1 or 2, characterized in that it contains, based on a complete weight of the polishing composition, 0.005 to 10% by weight of the abrasive particles (A).

4. The aqueous polishing composition according to anyone of the claims 1 to 3, characterized in that the linear and branched alkylene oxide homopolymers and copolymers (B) are selected from the group consisting of ethyleneoxide and propyleneoxide homopolymers and copolymers.

5. The aqueous polishing composition according to claim 4, characterized in that it contains polyethylene glycol PEG as the ethyleneoxide homopolymer (B).

6. The aqueous polishing composition according to anyone of the claims 1 to 5, characterized in that the anionic phosphate dispersing agent (C) is selected from the group of water-soluble condensed phosphates.

7. The aqueous polishing composition according to claim 6, characterized in that the water-soluble condensed phosphate (C) 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.

8. The aqueous polishing composition according to anyone of the claims 1 to 7, characterized in that it contains at least one pH-adjusting agent or buffering agent (E) different from the components (A), (B) and (C).

9. The aqueous polishing composition according to anyone of the claims 1 to 8, characterized in that it contains at least one functional component (D) different from the components (A), (B) and (C).

10. The aqueous polishing composition according to claim 9, 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, organic polyols having at least 2 hydroxy groups that are not dissociable in the aqueous medium, oligomers and polymers formed from at least one monomer having at least 2 hydroxy groups that are not dissociable in the aqueous medium, complexing or chelating agents, frictive agents, stabilizing agents, rheology agents, surfactants, metal cations and organic solvents.

11. The aqueous polishing composition according to anyone of the claims 1 to 10, characterized in that pH value is from 3 to 10.

12. 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 material until the desired planarity is achieved, characterized in that the aqueous polishing composition according to anyone of the claims 1 to 11 is used.

13. The process according to claim 12, characterized in that the substrates comprise at least one layer containing or consisting of at least one silicon oxide dielectric material and at least one layer containing or consisting of polysilicon.

14. The process according to claim 13, characterized in that the oxide-to-polysilicon selectivity is greater than 50.

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

16. The process according to claim 15, characterized in that the oxide-to-nitride selectivity is in the range of from 3 to 6.

17. The process according to claim 15 or 16, characterized in that the nitride-to-polysilicon selectivity is >10.

18. The process according to anyone of the claims 12 to 17, 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.

19. The process according to claim 18, 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.

Claims

1. An invention not claimed in any divisional application.