Claims:

[Claim 1]

A polishing pad, which comprises a polishing layer comprising a cured product of a composition comprising a urethane-based prepolymer, a curing agent, and a foaming agent,

wherein the content of the oxygen (O) element in the polishing layer is 15% by weight to 19% by weight based on the total weight of the polishing layer, and

the total content of the nitrogen (N) and oxygen (O) elements in the polishing layer is 20% by weight to 27% by weight based on the total weight of the polishing layer.

[Claim 2]

The polishing pad of claim 1, wherein the total content of the carbon (C), nitrogen (N), oxygen (O), and hydrogen (H) elements is 92% by weight to 96% by weight based on the total weight of the polishing layer, or

the total content of the nitrogen (N), oxygen (O), and hydrogen (H) elements in the polishing layer is 30% by weight to 35% by weight based on the total content of the carbon (C), nitrogen (N), oxygen (O), and hydrogen (H) elements in the polishing layer, or

both of which are satisfied.

[Claim 3]

The polishing pad of claim 1, wherein the urethane-based prepolymer comprises a prepolymerization reaction product of at least one diisocyanate compound and at least two polyols, the at least two polyols are at least one single-molecule-type polyol and at least one polymer-type polyol, and the polishing pad satisfies at least one of:

a mixed weight ratio of the diisocyanate compound and the polyol of 1:1.35 to 1.55;

a mixed weight ratio of the single-molecule-type polyol and the polymer-type polyol of 1:8 to 10;

a mixed weight ratio of the diisocyanate compound and the polymer-type polyol of 1:1.2 to 1.43; and

a mixed weight ratio of the diisocyanate compound and the single-molecule-type polyol of 1:0.11 to 0.15.

[Claim 4]

The polishing pad of claim 3, which, based on the total weight of the composition, satisfies at least one of:

29.9% by weight to 35% by weight of the diisocyanate compound;

35% by weight to 42.8% by weight of the polymer-type polyol;

4.0% by weight to 4.5% by weight of the single-molecule-type polyol; and

16.0% by weight to 20% by weight of the curing agent.

[Claim 5]

The polishing pad of claim 3, wherein the polymer-type polyol comprises at least one selected from the group consisting of a polytetramethylene glycol (PTMG), a polytetramethylene ether glycol (PTMEG), a polyether polyol, a polyester polyol, a polycarbonate polyol, and a polycaprolactone polyol, and

the single-molecule-type polyol comprises at least one selected from the group consisting of ethylene glycol (EG), diethylene glycol (DEG), propylene glycol (PG), propanediol (PDO), and methyl propanediol (MP-diol).

[Claim 6]

The polishing pad of claim 1,

wherein the content of the nitrogen (N) element in the polishing layer is 7% by weight to 10% by weight based on the total weight of the polishing layer, and

the total content of the nitrogen (N), carbon (C), oxygen (O), and hydrogen (H) elements in the polishing layer is 90% to 96% by weight based on the total weight of the polishing layer.

[Claim 7]

The polishing pad of claim 6, wherein the urethane-based prepolymer comprises a prepolymerization reaction product of at least two diisocyanate compounds and at least one polyol, and the at least two diisocyanate compounds comprise at least one alicyclic diisocyanate compound and at least one aromatic diisocyanate compound.

[Claim 8]

The polishing pad of claim 7, wherein the nitrogen (N) element in the polishing layer is derived from the curing agent, the alicyclic diisocyanate compound, and the aromatic diisocyanate compound, and the polishing pad satisfies at least one of:

a molar ratio of the nitrogen (N) element derived from the diisocyanate compound and the nitrogen (N) element derived from the curing agent of 2.0 to 2.7:1;

a molar ratio of the nitrogen (N) element derived from the alicyclic diisocyanate compound and the nitrogen (N) element derived from the aromatic diisocyanate compound of 0.05 to 0.082:1; and

a mixed weight ratio of the alicyclic diisocyanate compound and the aromatic diisocyanate compound of 1:7 to 10.

[Claim 9]

The polishing pad of claim 7, wherein the content of the alicyclic diisocyanate compound is 2.5% by weight to 3.30% by weight based on the total weight of the composition,

the content of the aromatic diisocyanate compound is 26.7% by weight to 30.0% by weight based on the total weight of the composition, and

the content of the curing agent is 17.0% by weight to 22% by weight based on the total weight of the composition.

[Claim 10]

A process for preparing a semiconductor device using the polishing pad of claim 1, which comprises mounting the polishing pad comprising a polishing layer on a platen; and relatively rotating the polishing surface of the polishing layer and the surface

of a semiconductor substrate while they are in contact with each other to polish the surface of the semiconductor substrate.