CLAIMS

[Claim 1]. A polishing pad comprising:

a polishing layer,

wherein the polishing layer includes zinc (Zn), iron (Fe) and aluminum (Al), and

a concentration of the zinc (Zn) is 0.5 ppm to 40 ppm parts by weight based on a total weight of the polishing layer,

wherein the polishing layer has a total oxidizing power index of 1.5 to 10 represented by the following Equation 3:

[Equation 3]

$$\text{Total oxidizing power index} = (Con._{Al} \times Oxi._{Al}) + (Con._{Zn} \times Oxi._{Zn}) + (Con._{Fe} \times Oxi._{Fe})$$

wherein the $Con._{Al}$ is a concentration value in ppm of the weight of the aluminum (Al) based on the total weight of the polishing layer, the $Con._{Zn}$ is a concentration value in ppm of the weight of the zinc (Zn) based on the total weight of the polishing layer, the $Con._{Fe}$ is a concentration value in ppm of the iron (Fe) weight based on the total weight of the polishing layer,

the $Oxi._{Al}$ is an ionization index of the aluminum (Al), and is a value obtained by dividing the reciprocal of the primary ionization energy of the aluminum (Al) by the sum of the reciprocal of the primary ionization energy of the aluminum (Al), the reciprocal of the primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe),

the $Oxi._{zn}$ is an ionization index of the zinc (Zn), and is a value obtained by dividing the reciprocal of the primary ionization energy of the zinc (Zn) by the sum of the reciprocal of the primary ionization energy of aluminum (Al), the reciprocal of the

primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe), and

the $Oxi._{Fe}$ is an ionization index of the iron (Fe), and is a value obtained by dividing the reciprocal of the primary ionization energy of the iron (Fe) by the sum of the reciprocal of the primary ionization energy of the aluminum (Al), the reciprocal of the primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe).

[Claim 2]. The polishing pad of claim 1, wherein the polishing layer further includes iron (Fe), and

a concentration of the iron (Fe) is 1 ppm to 50 ppm parts by weight based on the total weight of the polishing layer.

[Claim 3]. The polishing pad of claim 1, wherein the polishing layer further includes aluminum (Al), and

a concentration of the aluminum (Al) is 2 ppm to 50 ppm parts by weight based on the total weight of the polishing layer.

[Claim 4]. The polishing pad of claim 1, wherein a sum of the concentrations of the iron (Fe), the zinc (Zn), and the aluminum (Al) from a polishing surface of the polishing layer to a depth of 1/2 of a total thickness is 8 ppm to 3 ppm parts by weight based on the total weight of the polishing layer.

[Claim 5]. The polishing pad of claim 1, wherein the polishing layer has a

hardness of 53 to 60 Shore D, and the polishing layer has an elongation of 80 to 110%.

[Claim 6]. A method for manufacturing a polishing pad, the method comprising:

preparing a pre-composition containing a prepolymer;

mixing zinc (Zn), iron (Fe) and aluminum (Al) with the pre-composition;

preparing a composition for manufacturing an polishing layer including the pre-composition, a foaming agent, and a curing agent; and

manufacturing a polishing layer having a concentration of zinc (Zn) of 0.5 ppm to 40 ppm parts by weight based on the total weight by curing the composition for manufacturing the polishing layer,

wherein the polishing layer has a total oxidizing power index of 1.5 to 10 represented by the following Equation 3:

[Equation 3]

$$\textit{Total oxidizing power index} = (Con._{Al} \times Oxi._{Al}) + (Con._{Zn} \times Oxi._{Zn}) + (Con._{Fe} \times Oxi_{Fe})$$

wherein the $Con._{Al}$ is a concentration value in ppm of the weight of the aluminum (Al) based on the total weight of the polishing layer, the $Con._{Zn}$ is a concentration value in ppm of the weight of the zinc (Zn) based on the total weight of the polishing layer, the $Con._{Fe}$ is a concentration value in ppm of the iron (Fe) weight based on the total weight of the polishing layer,

the $Oxi._{Al}$ is an ionization index of the aluminum (Al), and is a value obtained by dividing the reciprocal of the primary ionization energy of the aluminum (Al) by the sum of the reciprocal of the primary ionization energy of the aluminum (Al), the reciprocal of

the primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe),

the $Oxi._{zn}$ is an ionization index of the zinc (Zn), and is a value obtained by dividing the reciprocal of the primary ionization energy of the zinc (Zn) by the sum of the reciprocal of the primary ionization energy of aluminum (Al), the reciprocal of the primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe), and

the $Oxi._{Fe}$ is an ionization index of the iron (Fe), and is a value obtained by dividing the reciprocal of the primary ionization energy of the iron (Fe) by the sum of the reciprocal of the primary ionization energy of the aluminum (Al), the reciprocal of the primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe).

[Claim 7]. The method of claim 6, wherein the urethane-based prepolymer includes an isocyanate compound,

the isocyanate compound includes at least one of an aromatic diisocyanate compound and an alicyclic diisocyanate compound, and

the content of an isocyanate group (-NCO) in the urethane-based prepolymer is 6 % by weight to 12 % by weight.

[Claim 8]. A method for manufacturing a semiconductor device, the method comprising:

providing a polishing pad including an polishing layer; and

arranging the polished surface of an object to be polished to be in contact with

the polishing surface of the polishing layer and then polishing the object to be polished while rotating relative to each other,

wherein the object to be polished includes a semiconductor substrate, and

the polishing layer includes zinc (Zn), iron (Fe) and aluminum (Al), and the concentration of zinc (Zn) is 0.5 ppm to 40 ppm parts by weight based on the total weight of the polishing layer,

wherein the polishing layer has a total oxidizing power index of 1.5 to 10 represented by the following Equation 3:

[Equation 3]

$$\textit{Total oxidizing power index} = (Con._{Al} \times Oxi._{Al}) + (Con._{Zn} \times Oxi._{Zn}) + (Con._{Fe} \times Oxi_{Fe})$$

wherein the $Con._{Al}$ is a concentration value in ppm of the weight of the aluminum (Al) based on the total weight of the polishing layer, the $Con._{Zn}$ is a concentration value in ppm of the weight of the zinc (Zn) based on the total weight of the polishing layer, the $Con._{Fe}$ is a concentration value in ppm of the iron (Fe) weight based on the total weight of the polishing layer,

the $Oxi._{Al}$ is an ionization index of the aluminum (Al), and is a value obtained by dividing the reciprocal of the primary ionization energy of the aluminum (Al) by the sum of the reciprocal of the primary ionization energy of the aluminum (Al), the reciprocal of the primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe),

the $Oxi._{zn}$ is an ionization index of the zinc (Zn), and is a value obtained by dividing the reciprocal of the primary ionization energy of the zinc (Zn) by the sum of the reciprocal of the primary ionization energy of aluminum (Al), the reciprocal of the

primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe), and

the $Oxi._{Fe}$ is an ionization index of the iron (Fe), and is a value obtained by dividing the reciprocal of the primary ionization energy of the iron (Fe) by the sum of the reciprocal of the primary ionization energy of the aluminum (Al), the reciprocal of the primary ionization energy of the zinc (Zn), and the reciprocal of the primary ionization energy of the iron (Fe).