CLAIMS

1. A dispersion liquid of a silica-based composite particle, containing a silica-based composite particle that has a core particle mainly composed of amorphous silica, and bound thereto a ceria particle mainly composed of crystalline ceria, the ceria particle further having on the surface thereof a silica film, the silica-based composite particle having an average particle size of 50 to 350 nm, and having features [1] to [3] below:

[1] the silica-based composite particle has a mass ratio of silica and ceria of 100:11 to 316;

[2] the silica-based composite particle when measured by X-ray diffractometry allows detection of a crystal phase of ceria only; and

[3] the silica-based composite particle when measured by X-ray diffractometry is found to have a crystallite size of crystalline ceria on the (111) plane of 10 to 25 nm,

wherein the silica-based composite particle contains impurities whose content rates satisfy (a) and (b) below:

(a) the content rate of each of Na, Ag, Al, Ca, Cr, Cu, Fe, K, Mg, Ni, Ti, Zn and Zr is 100 ppm or below; and

(b) the content rate of each of U, Th, Cl, NO_3, SO_4 and F is 5 ppm or below.

2. The dispersion liquid of a silica-based composite particle of Claim 1, wherein the silica-based composite particle, when determined by EDS measurement that selectively irradiates electron beam on the silica film observable under a transmission electron microscope, is found to have a ratio of Si atomic percentage relative to Ce atomic percentage (Si atomic percentage/Ce atomic percentage) of 0.9 or larger.

3. The dispersion liquid of a silica-based composite particle of any one of Claims 1 to 2, designed to give a streaming potential curve when subjected to cation colloidal titration, from which ratio (ΔPCD/V) of the amount of change of streaming potential (ΔPCD), and the amount of consumption

(V) of a cation colloidal titrant at a knick, given by Equation (1) below, is determined to be -110.0 to -15.0:

$$\Delta PCD/V = (I - C)/V \quad \cdots \quad \text{Equation (1)}$$

where,

C: streaming potential (mV) at knick; and

I: streaming potential (mV) at start point of streaming potential curve; and

V: amount of consumption (ml) of cation colloidal titrant at knick.

4. The dispersion liquid of a silica-based composite particle of any one of Claims 1 to 3, showing a negative streaming potential before being titrated, when kept within the range from pH3 to 8.

5. A polishing slurry comprising the dispersion liquid of a silica-based composite particle described in any one of Claims 1 to 4.

6. The polishing slurry of Claim 5, designed to be used for planarizing a semiconductor substrate having a silica film formed thereon.

7. A method of manufacturing a dispersion liquid of a silica-based composite particle, the method comprising Step 1 to Step 3 below:

Step 1: keeping a silica particle dispersion liquid, having a silica particle dispersed in a solvent, stirred at a temperature of 5 to 98°C, and at a pH of 7.0 to 9.0, and adding thereto a metal cerium salt in a continuous or intermittent manner, to thereby obtain a precursor particle dispersion liquid containing a precursor particle;

Step 2: drying the precursor particle dispersion liquid, followed by calcination at 400 to 1,200°C, subjecting the obtained calcined product to treatment (i) or (ii) below, to thereby obtain a dispersion liquid of the disintegrated calcined product:

(i) dry disintegration/grinding, followed by addition of

a solvent for solvent dispersion; or

(ii) wet disintegration/grinding under addition of a solvent, conducted at pH8.6 to 10.8, and,

Step 3: centrifuging the dispersion liquid of the disintegrated calcined product at a relative centrifugal acceleration of 300 G or larger, and removing a precipitated component, to thereby obtain a dispersion liquid of a silica-based composite particle,

wherein the silica-based composite particle contains impurities whose content rates satisfy (a) and (b) below:

(a) the content rate of each of Na, Ag, Al, Ca, Cr, Cu, Fe, K, Mg, Ni, Ti, Zn and Zr is 100 ppm or below; and

(b) the content rate of each of U, Th, Cl, NO_3, SO_4 and F is 5 ppm or below.