CLAIM(S)

1. A method of producing a dispersion of irregularly shaped silica-based fine particles, the method comprising steps (a) to (f) below:

Step (a): obtaining a seed particle precursor dispersion by adjusting an aqueous alkali silicate solution so that a ratio of the number of moles of silica to the number of moles of alkali metal falls within a range of 0.5 to 10, and adding thereto alkali as needed so that a SiO_2 concentration falls within a range of 2 mass% to 25 mass% and ionic strength is 0.4 or more;

Step (b): subjecting the seed particle precursor dispersion obtained in the step (a) to heat-aging in a temperature range of 40 degrees C or more but less than 100 degrees C;

Step (c): obtaining a seed particle dispersion by adding an acidic silicic acid solution to the seed particle precursor dispersion subjected to the heat-aging in the step (b) so that a molar ratio of an amount of silica in the acidic silicic acid solution to an amount of silica in the seed particle precursor dispersion ([silica amount in acidic silicic acid solution] / [silica amount in seed particle precursor dispersion]) is in a range of 0.5 to 10;

Step (d): adjusting, through addition of alkali as needed, the seed particle dispersion obtained in the step (c) so that the SiO_2 concentration falls within a range of 2 mass% to 15 mass% and the ionic strength is 0.25 or more;

Step (e): subjecting the seed particle dispersion obtained in the step (d), of which SiO_2 concentration and ionic strength are adjusted, to heat-aging in a temperature range of 40 degrees C or more but less than 100 degrees C; and

Step (f): obtaining a dispersion of irregularly shaped silica-based fine particles that comprises irregularly shaped silica-based fine particles by adding an acidic silicic acid solution to the seed particle dispersion subjected to the heat-aging in the step (e) so that a molar ratio of an amount of silica in the acidic silicic acid solution to an amount of silica in the seed particle dispersion ([silica amount in acidic silicic acid solution] / [silica amount in seed particle dispersion]) falls within a range of 5 to 20.

2. The method of producing the dispersion of irregularly shaped silica-based fine particles according to claim 1, wherein, in the step (a), the seed particle precursor dispersion is adjusted through the addition of alkali as needed so that the SiO_2

concentration falls within a range of 5 mass% to 20 mass% and the ionic strength is 0.4 or more.

3. The method of producing the dispersion of irregularly shaped silica-based fine particles according to claim 1 or 2, wherein the irregularly shaped silica-based fine particles have an average degree of shape irregularity of 1.2 to 10.

4. The method of producing the dispersion of irregularly shaped silica-based fine particles according to any one of claims 1 to 3, wherein at least one ionic strength adjuster selected from the group consisting of sodium hydroxide and potassium hydroxide is used as the alkali used in the step (b) and the alkali used in the step (d).

5. The method of producing the dispersion of irregularly shaped silica-based fine particles according to any one of claims 1 to 4, wherein no alkali halide is used in all of the steps (a) to (f).

6. A dispersion of irregularly shaped silica-based fine particles comprising irregularly shaped silica-based fine particles that satisfy conditions [1] to [4] below:

Condition [1]: an average particle size by a dynamic light scattering method is in a range of 10 nm to 300 nm;

Condition [2]: an average particle size in terms of a nitrogen adsorption method is in a range of 5 nm to 200 nm;

Condition [3]: an average degree of shape irregularity determined through analysis of a scanning electron micrograph is in a range of 1.2 to 10; and

Condition [4]: in a particle size distribution determined through analysis of a scanning electron micrograph, provided that an average degree of shape irregularity of particles in a range where a ratio of the number of the particles counting from a side on which a particle size is small ([the number of particles counting from the side on which the particle size is small] / [a total number of particles]) is more than 0 and 1/10 or less is taken as [A], and an average degree of shape irregularity of particles in a range where the ratio of the number of the particles counting from the side on which the particle size is small ([the number of particles counting from the side on which the particle size is small] / [the total number of particles]) is more than 9/10 and 10/10 or less is taken as [B], a [B]/[A] value is 1.2 or more.

7. The dispersion of irregularly shaped silica-based fine particles according to claim 6, wherein the [A] value is 1.13 or more in the condition [4].

8. The dispersion of irregularly shaped silica-based fine particles according to claim 6 or 7, wherein the irregularly shaped silica-based fine particles satisfy a condition [5] below,

Condition [5]: in a case where a degree of shape irregularity of particles is determined through analysis of a scanning electron micrograph, a ratio of irregularly shaped particles to all particles ([the number of particles having a degree of shape irregularity of 1.2 or more] / [the total number of particles] x 100%) is 45% or more.

9. The dispersion of irregularly shaped silica-based fine particles according to any one of claims 6 to 8, wherein the irregularly shaped silica-based fine particles satisfy a condition [6] below,

Condition [6]: provided that the number of particles having a steric structure is taken as T and the total number of particles is taken as S through analysis of a scanning electron micrograph, a steric structure ratio (T/S × 100%) is 10% or more.