WHAT IS CLAIMED IS:

[Claim 1]

A flocculation state determination method, being a method for irradiating laser light into a liquid containing particles and determining a flocculation state of the particles based on a light reception intensity of scattered light that results from the laser light being scattered by the particles, the flocculation state determination method comprising:

determining the flocculation state of the particles based on a change index that represents a change in the light reception intensity, and

the change index is a statistical value using each integral value of the light reception intensity when the floc formation state measurement time domain is obtained n times.

[Claim 2]

The flocculation state determination method according to claim 1, wherein the change index is a light reception amount change index CI expressed by formula (1),

[Formula 1]

$$CI = \frac{\frac{1}{n-1}\sum_{i=1}^{n}|S_i - S_{ave}|}{S_{ave}} \qquad \cdots formula\ (1)$$

in the formula (1),

S_i: Integral value of the light reception intensity in an i-th floc formation state measurement time domain,

S_{ave}: Average value of integral values of the light reception intensity in the floc formation state measurement time domain when the light reception intensity is obtained n times in the floc formation state measurement time domain.

[Claim 3]

The flocculation state determination method according to claim 1 or 2, comprising:

determining the flocculation state to be good in a case where the change index is equal to or greater than a first threshold and is equal to or less than a second threshold, which is a value greater than the first threshold.

[Claim 4]

The flocculation state determination method according to claim 1 or 2, comprising: determining the flocculation state of the particles based on a relationship between a particle diameter of the particles and a change range of the light reception intensity, in addition to the change index.

[Claim 5]

The flocculation state determination method according to claim 1 or 2, comprising: obtaining in advance a relationship between the change index and a particle diameter, and performing determination based on the change index in a particle diameter range decided based on the relationship.

[Claim 6]

A flocculation treatment method for adding a flocculant into a liquid containing particles and flocculating the particles, the flocculation treatment method comprising:

a determination process of irradiating laser light into the liquid and determining a flocculation state of the particles based on a change index that represents a change in a light reception intensity of scattered light that results from the laser light being scattered by the particles; and

a flocculant addition process of adding the flocculant in an addition amount based on the flocculation state of the particles determined in the determination process, and

the change index is a statistical value using each integral value of the light reception intensity when the floc formation state measurement time domain is obtained n times.

[Claim 7]

The flocculation treatment method according to claim 6, wherein the change index is a light

reception amount change index value CI expressed by formula (2),

[Formula 2]

$$CI = \frac{\frac{1}{n-1}\sum_{i=1}^{n}|S_i - S_{ave}|}{S_{ave}} \qquad \cdots formula\ (2)$$

in the formula (2),

S_i: Integral value of the light reception intensity in an i-th floc formation state measurement time domain,

S_{ave}: Average value of integral values of the light reception intensity in the floc formation state measurement time domain when the light reception intensity is obtained n times in the floc formation state measurement time domain.

[Claim 8]

The flocculation treatment method according to claim 6 or 7, comprising: increasing the addition amount of the flocculant in a case where the change index is less than a first threshold, and decreasing the addition amount of the flocculant in a case where the change index exceeds a second threshold, which is a value greater than the first threshold.

[Claim 9]

The flocculation treatment method according to claim 8, comprising: stopping decreasing the addition amount of the flocculant when the change index reaches a third threshold, which is a value greater than the first threshold and less than the second threshold, after exceeding the second threshold.