for treatments to repeat the steps of collecting and concentrating the supernatant, and there is a problem of inferior production efficiency of a graphene dispersion. As disclosed in Patent Literature 2, even by subjecting natural graphite to an ultrasonic treatment for a long time, only weak parts of the surface are exfoliated, other large parts do not contribute to the exfoliation, and it is considered as a problem that the amount of exfoliated graphene is small.

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The invention was completed focusing on such problem points, and a graphite-based carbon material, from which graphene is easily exfoliated by carrying out predetermined treatments to natural graphite, and which makes it possible to disperse graphene at a high concentration or to a high degree is called a graphene precursor. Embodiments of the invention seek to provide a graphene precursor, as well as a method of producing the same.

{Solution to Problem}

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An aspect of the present invention provides a graphene precursor comprising a graphite-based carbon material, the graphite-based carbon material being particles having a diameter of about 1 to 10 μm and having a rhombohedral graphite layer (3R) and a hexagonal graphite layer (2H), wherein

CLAIMS

Claim 1

A graphene precursor comprising a graphite-based carbon material, the graphite-based carbon material being particles having a diameter of about 1 to 10 μm and having a rhombohedral graphite layer and a hexagonal graphite layer, wherein a Rate of the rhombohedral graphite layer and the hexagonal graphite layer, based on an X-ray diffraction method, which is defined by following Equation 1 is 31% or more:

$$\text{Rate} = P3/(P3+P4)\times 100 \cdots \text{Equation 1}$$

wherein

P3 is a peak intensity count over a first degree range of a (101) plane of the rhombohedral graphite layer based on the X-ray diffraction method, and

P4 is a peak intensity count over a second degree range of a (101) plane of the hexagonal graphite layer based on the X-ray diffraction method.

Claim 2

Use of the graphene precursor according to claim 1 as a material for manufacture of a graphene composite, the graphene composite comprising graphene exfoliated from the graphite-based carbon material and dispersed in a base material.

Claim 3

The graphene precursor according to claim 1, wherein the Rate is 40% or more.

Claim 4

The graphene precursor according to claim 1, wherein the Rate is 50% or more.

Claim 5

The graphene precursor according to claim 1, wherein an intensity ratio P1/P2 of the hexagonal graphite layer based on the X-ray diffraction method is 0.01 or more, wherein

P1 is a peak intensity count over a third degree range of a (100) plane of the hexagonal graphite layer based on the X-ray diffraction method, and

P2 is a peak intensity count over a fourth degree range of a (002) plane of the hexagonal graphite layer based on the X-ray diffraction method.

Claim 6

The graphene precursor according to claim 1, wherein the graphite-based carbon material is produced by carrying out a radiowave-force-based treatment and a physical-force-based treatment in a vacuum or in the air.

Claim 7

A method of producing the graphene precursor comprising a graphite-based carbon material according to claim 1, comprising: carrying out a radiowave-force-based treatment and a physical-force-based treatment to a natural graphite material in a vacuum or in the air.

Claim 8

A method of producing the graphene precursor comprising a graphite-based carbon material, wherein the natural graphite material as set forth in claim 7 has at least a hexagonal graphite layer, and an intensity ratio P1/P2 of the hexagonal graphite layer based on the X-ray diffraction method is less than 0.01, wherein

P1 is a peak intensity count over the third degree range of a (100) plane of the hexagonal graphite layer based on the X-ray diffraction method, and

P2 is a peak intensity count over the fourth degree range of a (002) plane of the hexagonal graphite layer based on the X-ray diffraction method.