Claims

1. A resin composition comprising a nanocellulose and a polymer of an ethylenically unsaturated monomer, wherein the nanocellulose

comprises an oxide of a cellulose raw material by a hypochlorous acid or a salt thereof,

is substantially free of a N-oxyl compound, and

satisfies following (I) and/or (II):

(I) zeta potential is -30 mV or less; and

(II) light transmittance in a mixed solution in which the nanocellulose and water are mixed and which has a solid content concentration of 0.1 mass% is 95% or more, and

wherein the nanocellulose has an average fiber length of 100 nm or more and 700 nm or less.

2. A resin composition comprising a nanocellulose and a polymer of an ethylenically unsaturated monomer, wherein the nanocellulose

has a structure in which hydroxyl groups at the 2nd position and the 3rd position of a glucopyranose ring are oxidized and carboxy groups are introduced, and

satisfies following (I) and/or (II):

(I) zeta potential is -30 mV or less; and

(II) light transmittance in a mixed solution in which the nanocellulose and water are mixed and which has a solid content concentration of 0.1 mass% is 95% or more, and

wherein the nanocellulose has an average fiber length of 100 nm or more and

700 nm or less.

3. The resin composition according to claim 1 or 2,

wherein the nanocellulose has zeta potential of -70 mV or more.

4. The resin composition according to any one of claims 1 to 3,

wherein the nanocellulose has a carboxy group content of 0.30 mmol/g or more and less than 2.0 mmol/g.

5. The resin composition according to any one of claims 1 to 4,

wherein the nanocellulose is derived from an oxidized cellulose, and

wherein a degree of polymerization of the oxidized cellulose is 600 or less.

6. The resin composition according to any one of claims 1 to 5,

wherein the polymer of the ethylenically unsaturated monomer comprises a rubber-modified styrene resin.

7. The resin composition according to any one of claims 1 to 5,

wherein the polymer of the ethylenically unsaturated monomer comprises a polyvinyl alcohol.

8. The resin composition according to any one of claims 1 to 7,

wherein an amount of the polymer of the ethylenically unsaturated monomer with respect to 100 parts by mass of the nanocellulose is 5 parts by mass or more and 1,000 parts by mass or less.

9. The resin composition according to any one of claims 1 to 8,

wherein at least part of the nanocellulose is modified with a metallic soap, an amine or a quaternary ammonium.

10. A method of producing a resin composition, the method comprising a step of polymerizing an ethylenically unsaturated monomer in the presence of a nanocellulose, wherein the nanocellulose

is an oxide of a cellulose raw material by a hypochlorous acid or a salt thereof,

is substantially free of a N-oxyl compound, and

satisfies following (I) and/or (II):

(I) zeta potential is -30 mV or less; and

(II) light transmittance in a mixed solution in which the nanocellulose and water are mixed and which has a solid content concentration of 0.1 mass% is 95% or more, and

wherein the nanocellulose has an average fiber length of 100 nm or more and 700 nm or less.

11. The production method according to claim 10,

wherein the polymerization method is an emulsion polymerization or a suspension polymerization.

12. A method of producing a resin composition comprising a nanocellulose and a polymer of an ethylenically unsaturated monomer, the method comprising:

a step of stirring a first mixture comprising an oxidized cellulose and an

ethylenically unsaturated monomer to obtain a second mixture comprising the nanocellulose and the ethylenically unsaturated monomer; and

a step of polymerizing the ethylenically unsaturated monomer using the second mixture,

wherein the oxidized cellulose comprises an oxide of a cellulose raw material by a hypochlorous acid or a salt thereof,

the nanocellulose has an average fiber length of 100 nm or more and 700 nm or less,

the nanocellulose satisfies following (I) and/or (II):

(I) zeta potential is -30 mV or less; and

(II) light transmittance in a mixed solution in which the nanocellulose and water are mixed and which has a solid content concentration of 0.1 mass% is 95% or more, and

the oxidized cellulose has a degree of polymerization of 600 or less.

13. A method of producing a resin composition comprising a nanocellulose and a polymer of an ethylenically unsaturated monomer, the method comprising:

a step of stirring an oxidized cellulose and continuously adding the ethylenically unsaturated monomer to obtain a mixture comprising the nanocellulose and the ethylenically unsaturated monomer; and

a step of polymerizing the ethylenically unsaturated monomer using the mixture,

wherein the oxidized cellulose comprises an oxide of a cellulose raw material by a hypochlorous acid or a salt thereof,

the nanocellulose has an average fiber length of 100 nm or more and 700 nm

or less,

the nanocellulose satisfies following (I) and/or (II):

(I) zeta potential is -30 mV or less; and

(II) light transmittance in a mixed solution in which the nanocellulose and water are mixed and which has a solid content concentration of 0.1 mass% is 95% or more, and

the oxidized cellulose has a degree of polymerization of 600 or less.

14. The production method according to claim 12 or 13,

wherein the polymerization method is an emulsion polymerization or a suspension polymerization.

15. A method of producing a resin composition comprising a nanocellulose and a polymer of an ethylenically unsaturated monomer, the method comprising

a step of stirring a first mixture comprising an oxidized cellulose and the polymer of the ethylenically unsaturated monomer to obtain the resin composition comprising the nanocellulose and the polymer of the ethylenically unsaturated monomer,

wherein the oxidized cellulose comprises an oxide of a cellulose raw material by a hypochlorous acid or a salt thereof,

the nanocellulose has an average fiber length of 100 nm or more and 700 nm or less,

the nanocellulose satisfies following (I) and/or (II):

(I) zeta potential is -30 mV or less; and

(II) light transmittance in a mixed solution in which the nanocellulose and water

are mixed and which has a solid content concentration of 0.1 mass% is 95% or more, and

the oxidized cellulose has a degree of polymerization of 600 or less.

16. A method of producing a resin composition comprising a nanocellulose and a polymer of an ethylenically unsaturated monomer, the method comprising

a step of stirring an oxidized cellulose and continuously adding the polymer of the ethylenically unsaturated monomer to obtain the resin composition comprising the nanocellulose and the polymer of the ethylenically unsaturated monomer,

wherein the oxidized cellulose comprises an oxide of a cellulose raw material by a hypochlorous acid or a salt thereof,

the nanocellulose has an average fiber length of 100 nm or more and 700 nm or less,

the nanocellulose satisfies following (I) and/or (II):

(I) zeta potential is -30 mV or less; and

(II) light transmittance in a mixed solution in which the nanocellulose and water are mixed and which has a solid content concentration of 0.1 mass% is 95% or more, and

the oxidized cellulose has a degree of polymerization of 600 or less.

17. The production method according to any one of claims 12 to 16,

wherein the oxidized cellulose is substantially free of a N-oxyl compound.

18. The production method according to any one of claims 12 to 17, further comprising

a step of adding a metallic soap, an amine or a quaternary ammonium to precipitate the nanocellulose and the polymer of the ethylenically unsaturated monomer.

19. A resin comprising the resin composition according to any one of claims 1 to 9.

20. A polyvinyl alcohol film produced from the resin composition according to claim 7.