CLAIMS:

1. A coloring composition comprising:

colorants; and

a resin,

wherein the colorants include one or more first colorants having an absorption maximum in a wavelength range of 800 to 900 nm and two or more second colorants having an absorption maximum in a wavelength range of 400 to 700 nm,

a content of the first colorants is 10 to 200 parts by mass with respect to 100 parts by mass of the second colorants,

a content of the second colorants is 10 to 60 mass% with respect to the total solid content of the coloring composition,

a ratio A/B of a minimum value A of an absorbance in a wavelength range of 400 to 830 nm to a maximum value B of an absorbance in a wavelength range of 1000 to 1300 nm is 4.5 or higher, and

when a film having a thickness range of 0.5 to 50 μm is formed using the coloring composition, at least one value in the thickness range, a light transmittance in a thickness direction of the film has a maximum value of 20% or lower in a wavelength range of 400 to 830 nm and has a minimum value of 70% or higher in a wavelength range of 1000 to 1300 nm.

2. The coloring composition according to claim 1,

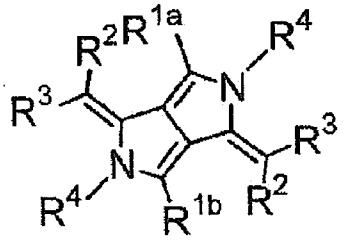
wherein the first colorants include a pyrrolopyrrole colorant compound.

3. The coloring composition according to claim 2,

wherein the pyrrolopyrrole colorant compound is a pigment.

4. The coloring composition according to claim 2 or 3,

wherein the pyrrolopyrrole colorant compound is represented by the following Formula (1),



(1)

in Formula (1), R^{1a} and R^{1b} each independently represent an alkyl group, an aryl group, or a heteroaryl group,

R^2 and R^3 each independently represent a hydrogen atom or a substituent,

at least one of R^2 or R^3 represents an electron-withdrawing group,

R^2 and R^3 may be bonded to each other to form a ring, and

R^4 represents a hydrogen atom, an alkyl group, an aryl group, a heteroaryl group, a substituted boron atom, or a metal atom and may form a covalent bond or a coordinate bond with one or more selected from the group consisting of R^{1a}, R^{1b}, and R^3.

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

wherein the colorants include, as the second colorants, two or more colorants selected from the group consisting of a red colorant, a yellow colorant, a blue colorant, and a violet colorant.

6. The coloring composition according to any one of claims 1 to 5, further comprising:

a polymerizable compound.

7. The coloring composition according to claim 6, further comprising:

a photopolymerization initiator.

8. The coloring composition according to any one of claims 1 to 7 which is used for forming a colored layer of a color filter.

9. The coloring composition according to any one of claims 1 to 5, further comprising,

a polymerizable compound, and

a photopolymerization initiator,

wherein the resin is an alkali soluble resin,

a content of the alkali-soluble resin is 1 to 15 mass% with respect to the total solid content of the coloring composition,

a content of the polymerizable compound is 2 to 30 mass% with respect to the total solid content of the coloring composition, and

a content of the photopolymerization initiator is 0.1 to 20 mass% with respect to the total solid content of the coloring composition.

10. The coloring composition according to any one of claims 1 to 9,

wherein the second colorants include a pigment, and

a content of the pigment in the second colorants is 95 mass% or higher.

11. The coloring composition according to any one of claims 1 to 10,

wherein the second colorants include C.I. Pigment Red 254, C.I. Pigment Yellow 139, C.I. Pigment Blue 15:6, or C.I. Pigment Violet 23.

12. The coloring composition according to claim 5,
wherein the second colorants include a red colorant, and
a ratio of the mass of the red colorant to the total mass of the second colorants is 0.1 to 0.4.

13. The coloring composition according to claim 5,
wherein the second colorants include a yellow colorant, and
a ratio of the mass of the yellow colorant to the total mass of the second colorants is 0.1 to 0.4.

14. The coloring composition according to claim 5,
wherein the second colorants include a blue colorant, and
a ratio of the mass of the blue colorant to the total mass of the second colorants is 0.2 to 0.6.

15. The coloring composition according to claim 5,
wherein the second colorants include a violet colorant, and
a ratio of the mass of the violet colorant to the total mass of the second colorants is 0.01 to 0.3.

16. The coloring composition according to any one of claims 1 to 15,
wherein the content of the second colorants is 30 to 50 mass% with respect to the total solid content of the coloring composition.

17. The coloring composition according to any one of claims 1 to 16,
wherein the content of the first colorants is 20 to 150 parts by mass with respect to 100 parts by mass of the second colorants.

18. The coloring composition according to any one of claims 1 to 17,
wherein the content of the first colorants is 30 to 80 parts by mass with respect to 100 parts by mass of the second colorants.

19. The coloring composition according to any one of claims 1 to 18,
wherein the second colorants include at least one colorant selected from the group consisting of a bisbenzofuranone pigment, an azomethine pigment, a perylene pigment, and an azo dye.

20. The coloring composition according to any one of claims 1 to 19,
wherein the second colorants include a bisbenzofuranone pigment.

21. The coloring composition according to any one of claims 1 to 20,
wherein the first colorant is a pigment.

22. The coloring composition according to any one of claims 1 to 21, satisfing at least one of the following spectal characteristics:

(1) when a film having a thickness of 1 μm after drying is formed using the composition, a light transmittance in a thickness direction of the film has a maximum value of 20% or lower in a wavelength range of 400 to 830 nm and has a minimum value of 70% or higher in a wavelength range of 1000 to 1300 nm,

(2) when a film having a thickness of 2 μm after drying is formed using the composition, a light transmittance in a thickness direction of the film has a maximum value of 20% or lower in a wavelength range of 400 to 830 nm and has a minimum value of 70% or higher in a wavelength range of 1000 to 1300 nm,

(3) when a film having a thickness of 3 μm after drying is formed using the composition, a light transmittance in a thickness direction of the film has a maximum value of 20% or lower in a wavelength range of 400 to 830 nm and has a minimum value of 70% or higher in a wavelength range of 1000 to 1300 nm, or

(4) when a film having a thickness of 5 μm after drying is formed using the composition according to the present invention, a light transmittance in a thickness direction of the film has a maximum value of 20% or lower in a wavelength range of 400 to 830 nm and has a minimum value of 70% or higher in a wavelength range of 1000 to 1300 nm.

23. The coloring composition according to claim 22,

wherein the second colorants include a red colorant, a yellow colorant, a blue colorant, and a violet colorant,

a ratio of the mass of the red colorant to the total mass of the second colorants is 0.1 to 0.4,

a ratio of the mass of the yellow colorant to the total mass of the second colorants is 0.1 to 0.4,

a ratio of the mass of the blue colorant to the total mass of the second colorants is 0.2 to 0.6, and

a ratio of the mass of the violet colorant to the total mass of the second colorants is 0.01 to 0.3.

24. A film comprising colorants,

wherein the colorants include one or more first colorants having an absorption maximum in a wavelength range of 800 to 900 nm and two or more second colorants having an absorption maximum in a wavelength range of 400 to 700 nm,

a content of the first colorants is 10 to 200 parts by mass with respect to 100 parts by mass of the second colorants,

a content of the second colorants in the film is 10 to 60 mass%,

a thickness of the film is 0.1 to 20 μm, and

a light transmittance in a thickness direction of the film has a maximum value of 20% or lower in a wavelength range of 400 to 830 nm and has a minimum value of 70% or higher in a wavelength range of 1000 to 1300 nm.

25. The film according to claim 24 which is formed by curing the coloring composition according to any one of claims 1 to 23.

26. A color filter comprising:

the film according to claim 24 or 25.

27. A pattern forming method comprising:

a step of applying the coloring composition according to any one of claims 1 to 23 to a support to form a coloring composition layer;

a step of exposing the coloring composition layer in a pattern shape; and

a step of forming a colored pattern by removing a non-exposed portion by development.

28. A method of manufacturing a color filter comprising:

the pattern forming method according to claim 27.

29. A solid image pickup element comprising:

the color filter according to claim 26 or a color filter which is obtained using the method of manufacturing a color filter according to claim 15.

30. An infrared sensor comprising:

the color filter according to claim 26 or a color filter which is obtained using the method of manufacturing a color filter according to claim 28.

31. The coloring composition according to any one of claims 1 to 21 and 23, further comprising a pigment derivative,

wherein the first colorants include a pigment, and

the second colorants include a pigment.

32. The coloring composition according to any one of claims 1 to 23,

wherein the resin is an alkali-soluble resin including a repeating unit having an ethylenically unsaturated bond.

33. The film according to claim 24, further comprising a pigment derivative,

wherein the first colorants include a pigment, and

the second colorants include a pigment.

34. The film according to claim 24, further comprising an alkali-soluble resin including a repeating unit having an ethylenically unsaturated bond.