Citation List

Patent Document

[0003]

Patent Document 1: Japanese Patent Application Laid-Open No. 2009-179678

Patent Document 2: Japanese Patent Application Laid-Open No. 2008-185683

Patent Document 3: Japanese Patent Application Laid-Open No. 2007-277514

Patent Document 4: Japanese Patent Application Laid-Open No. 2008-239923

Summary of Invention

Problems to be solved

[0004]

However, the composition for forming a material having a high refractive index as described above had a problem in that coated surface conditions deteriorate, such as the generation of uneven portions on the film surface after the composition is applied on a substrate and the like.

As a result of intensive studies, the present inventors have found that the coated surface conditions deteriorate because when the acid value of a dispersion resin as described above is high (for example, an acid value of 120 mgKOH/g or more), the acid groups of the dispersion resin are aggregated with each other, and a phase separation occurs between inorganic particles and the dispersion resin.

[0005]

The present invention has been made in consideration of the aforementioned circumstances, and an object of the present invention is to provide a dispersion composition which has a high refractive index and is has excellent surface conditions of a film surface after coating, a curable composition using the same, a transparent film, a microlens, and a solid-state imaging device.

Means for Solving the Problems

[0006]

In a first aspect, there is provided a dispersion composition comprising:

a colorless, white or transparent metal oxide particle (A) having a primary particle diameter of 1 nm to 100 nm;

a polymer compound (B) having an acid value of less than 120 mgKOH/g and being represented by Formula (1); and

a solvent (C):



Formula (1)

wherein, in Formula (1),

R^2 represents a single bond or a divalent linking group,

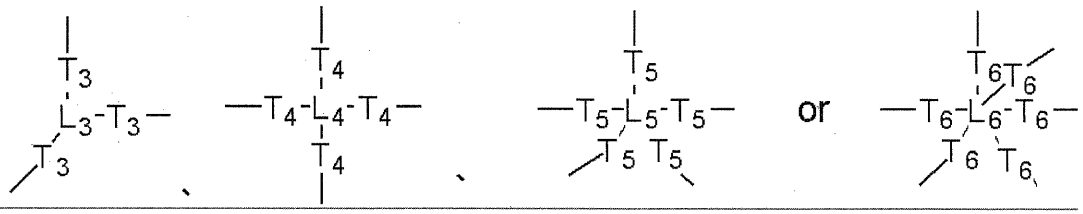
A^1 represents a monovalent substituent having at least one group selected from the group consisting of an acid group, a urea group, a urethane group, a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, an imide group, an alkyloxycarbonyl group, an alkyl amino carbonyl group, a carboxylate group, a sulfonamide group, a heterocyclic group, an alkoxysilyl group, an epoxy group, an isocyanate group, and a hydroxyl group,

n A^1's and n R^2's may be the same or different,

m represents a number of 1 or more, n represents a number of 1 or more, and m+n satisfies 3 to 6,

P^1 represents a polymer chain, and m P^1's may be the same or different, and

R^1 represents a linking group represented by any one of the following Formulae,



wherein, in the above Formulae,

L_3 represents a trivalent group

T_3 represents a single bond or a divalent linking group, and three T_3's may be the same or different,

L_4 represents a tetravalent group,

T_4 represents a single bond or a divalent linking group, and four T_4's may be the same or different,

L_5 represents a pentavalent group,

T_5 represents a single bond or a divalent linking group, and five T_5's may be the same or different,

L_6 represents a hexavalent group, and

T_6 represents a single bond or a divalent linking group, and six T_6's may be the same or different.

In another aspect, there is provided a curable composition comprising the dispersion composition as disclosed above and a polymerizable compound (D).

In yet another aspect, there is provided a transparent film formed by using the curable composition as disclosed above.

In still another aspect, there is provided a microlens formed by using a transparent film obtained by the curable composition as disclosed above.

In a further aspect, there is provided a solid-state imaging device comprising the microlens as disclosed above.

In still a further aspect, there is provided a method for preparing the dispersion composition as disclosed above.

Specific means for solving the problems are as follows.

<1> A dispersion composition containing a metal oxide particle (A) having a primary particle diameter of 1 nm to 100 nm, a polymer compound (B) having an acid value of less

CLAIMS

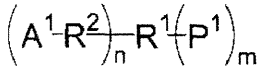
[Claim 1]

A dispersion composition comprising:

a colorless, white or transparent metal oxide particle (A) having a primary particle diameter of 1 nm to 100 nm;

a polymer compound (B) having an acid value of less than 120 mgKOH/g and being represented by Formula (1); and

a solvent (C):



Formula (1)

wherein, in Formula (1),

R^2 represents a single bond or a divalent linking group,

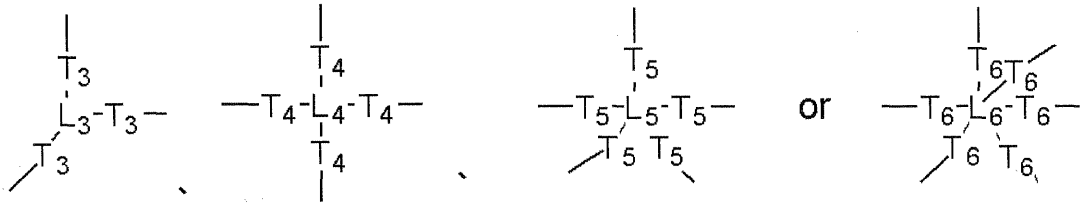
A^1 represents a monovalent substituent having at least one group selected from the group consisting of an acid group, a urea group, a urethane group, a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, an imide group, an alkyloxycarbonyl group, an alkyl amino carbonyl group, a carboxylate group, a sulfonamide group, a heterocyclic group, an alkoxysilyl group, an epoxy group, an isocyanate group, and a hydroxyl group,

n A^1's and n R^2's may be the same or different,

m represents a number of 1 or more, n represents a number of 1 or more, and m+n satisfies 3 to 6,

P^1 represents a polymer chain, and m P^1's may be the same or different, and

R^1 represents a linking group represented by any one of the following Formulae,



wherein, in the above Formulae,

L_3 represents a trivalent group

T_3 represents a single bond or a divalent linking group, and three T_3's may be the same or different,

L_4 represents a tetravalent group,

T_4 represents a single bond or a divalent linking group, and four T_4's may be the same or different,

L_5 represents a pentavalent group,

T_5 represents a single bond or a divalent linking group, and five T_5's may be the same or different,

L_6 represents a hexavalent group, and

T_6 represents a single bond or a divalent linking group, and six T_6's may be the same or different.

[Claim 2]

The dispersion composition according to claim 1,

wherein the polymer compound (B) has a weight average molecular weight of 5,000 to 8,000.

[Claim 3]

The dispersion composition according to claim 1 or 2,

wherein the polymer compound (B) has an acid value of 70 to 90 mgKOH/g.

[Claim 4]

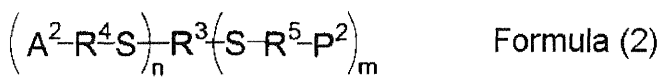
The dispersion composition according to any one of claims 1 to 3,

wherein a content of the metal oxide particle (A) is 65% by mass or more with respect to a total solid content of the dispersion composition.

[Claim 5]

The dispersion composition according to any one of claims 1 to 4,

wherein the polymer compound (B) is a polymer compound represented by Formula (2):



Formula (2)

wherein, in Formula (2),

R^4 and R^5 each independently represent a single bond or a divalent linking group,

A^2 represents a monovalent substituent having at least one group selected from the group consisting of an acid group, a urea group, a urethane group, a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, an alkyl

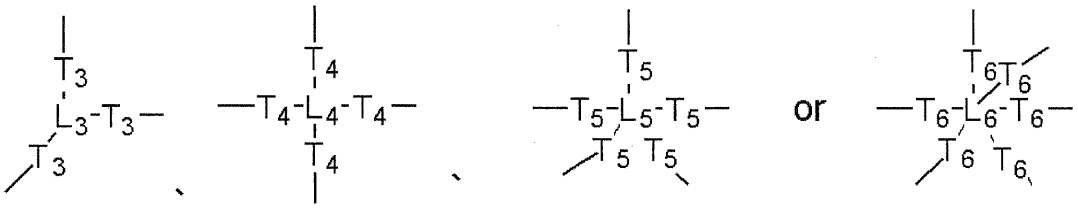
group, an aryl group, a group having an alkyleneoxy chain, an imide group, an alkyloxycarbonyl group, an alkyl amino carbonyl group, a carboxylate group, a sulfonamide group, a heterocyclic group, an alkoxysilyl group, an epoxy group, an isocyanate group, and a hydroxyl group,

n A^2's and n R^4's may be the same or different,

m represents a number of 1 or more, n represents a number of 1 or more, and m+n satisfies 3 to 6,

P^2 represents a polymer chain, and m P^2's and m R^5's may be the same or different, and

R^3 represents a linking group represented by any one of the following Formulae,



wherein, in the above Formulae,

L_3 represents a trivalent group

T_3 represents a single bond or a divalent linking group, and three T_3's may be the same or different,

L_4 represents a tetravalent group,

T_4 represents a single bond or a divalent linking group, and four T_4's may be the same or different,

L_5 represents a pentavalent group,

T_5 represents a single bond or a divalent linking group, and five T_5's may be the same or different,

L_6 represents a hexavalent group, and

T_6 represents a single bond or a divalent linking group, and six T_6's may be the same or different.

[Claim 6]

The dispersion composition according to any one of claims 1 to 5,

wherein A^1 in Formula (1) or A^2 in Formula (2) is a monovalent substituent having at least one group selected from the group consisting of an acid group, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, a hydroxyl group, a urea group, a urethane group, a sulfonamide group, an imide group and a group having a coordinating oxygen atom.

[Claim 7]

The dispersion composition according to any one of claims 1 to 5,

wherein A^1 in Formula (1) or A^2 in Formula (2) is a monovalent substituent having at least one functional group with a pKa of 5 or more.

[Claim 8]

The dispersion composition according to claim 7,

wherein the functional group with a pKa of 5 or more is a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, a urea group, a urethane group, an alkyl group, an aryl group, an alkyloxycarbonyl group, an alkyl amino carbonyl group, a group having an alkyleneoxy chain, an imide group, a carboxylate group, a sulfonamide group, a hydroxyl group or a heterocyclic group.

[Claim 9]

The dispersion composition according to any one of claims 1 to 8,

wherein the polymer chain represented by P^1 or P^2 is a polymer chain derived from at least one selected from a polymer or copolymer of vinyl monomers, an ester-based polymer, an ether-based polymer, a urethane-based polymer, an amide-based polymer, an epoxy-based polymer, a silicone-based polymer and a modified product or copolymer thereof.

[Claim 10]

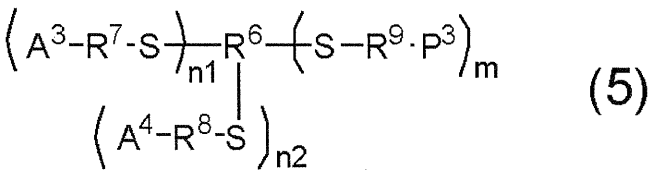
The dispersion composition according to any one of claims 1 to 9,

wherein the polymer chain represented by P^1 or P^2 contains at least one repeating unit, and a repeating number k of the at least one repeating unit is 3 to 60.

[Claim 11]

The dispersion composition according to any one of claims 1 to 10,

wherein the polymer compound (B) is a polymer compound represented by Formula (5):



(5)

wherein, in Formula (5),

R^7 to R^9 each independently represent a single bond or a divalent linking group,

A^3 represents a monovalent substituent having at least one acid group,

A^4 represents a monovalent substituent different from A^3,

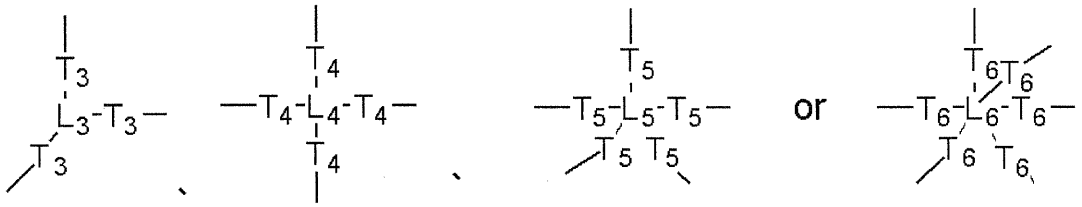
n1 A^3's and n1 R^7's may be the same or different,

n2 A^4's and n2 R^8's may be the same or different,

m represents a number of 1 or more, n1 represents a number of 1 or more, n2 represents a number of 1 or more, and m+n1+n2 satisfies 3 to 6,

P^3 represents a polymer chain, and m P^3's and m R^9's may be the same or different, and

R^6 represents a linking group represented by any one of the following Formulae,



wherein, in the above Formulae,

L_3 represents a trivalent group

T_3 represents a single bond or a divalent linking group, and three T_3's may be the same or different,

L_4 represents a tetravalent group,

T_4 represents a single bond or a divalent linking group, and four T_4's may be the same or different,

L_5 represents a pentavalent group,

T_5 represents a single bond or a divalent linking group, and five T_5's may be the same or different,

L_6 represents a hexavalent group, and

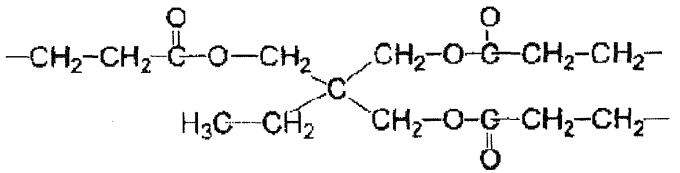
T_6 represents a single bond or a divalent linking group, and six T_6's may be the same or different.

[Claim 12]

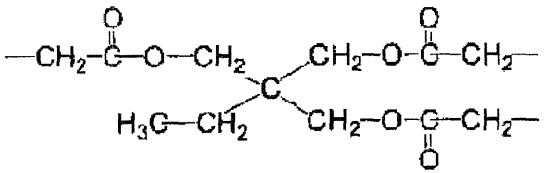
The dispersion composition according to any one of claims 1 to 11, wherein the metal oxide particle (A) is titanium dioxide, zirconium dioxide or silicon dioxide.

[Claim 13]

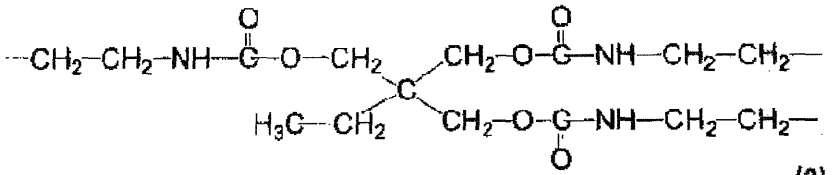
The dispersion composition according to any one of claims 1 to 12, wherein R^1, R^3 or R^6 is any one of the following (1) to (17):



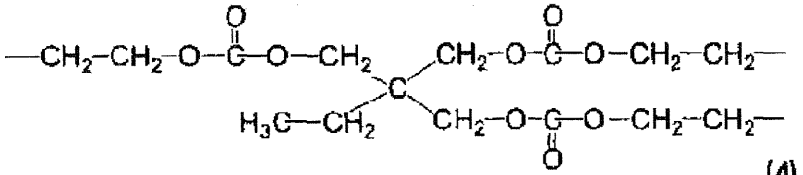
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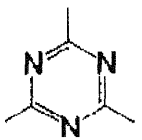
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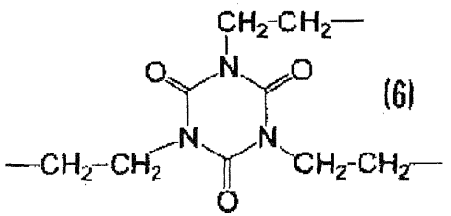
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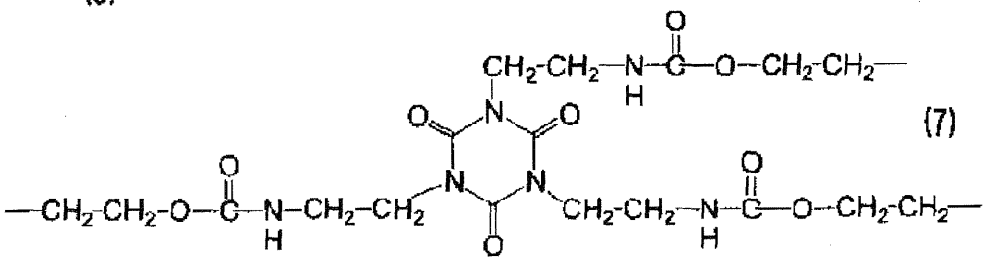
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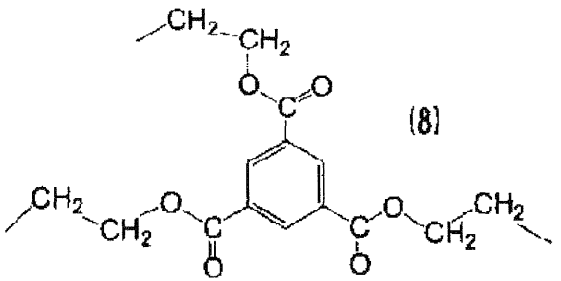
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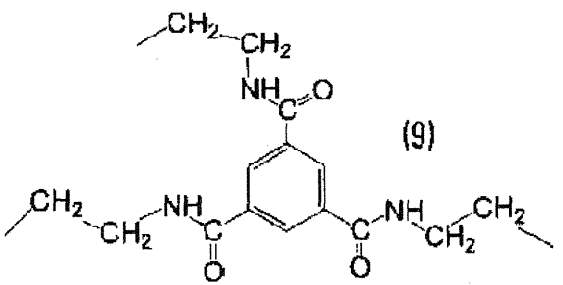
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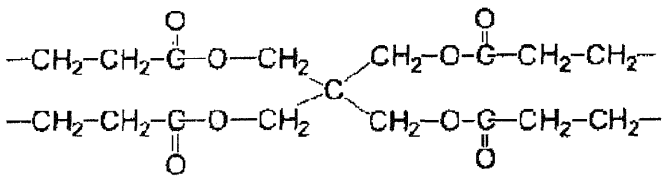
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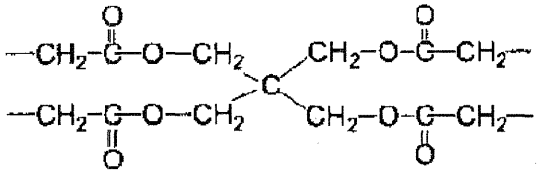
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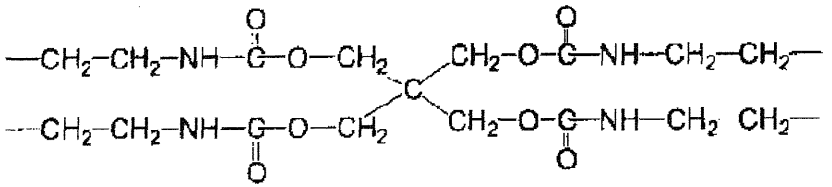
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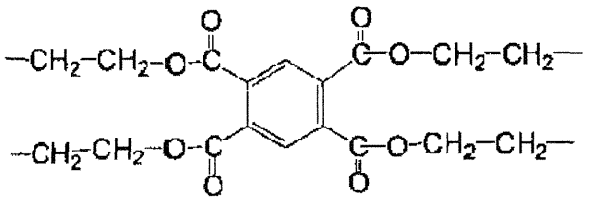
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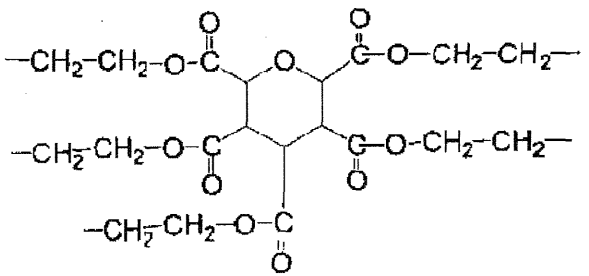
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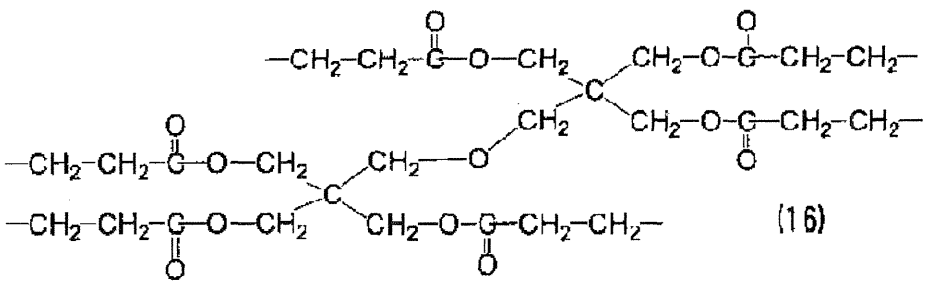
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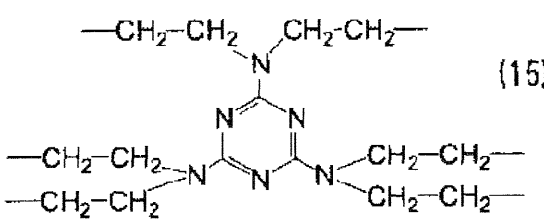
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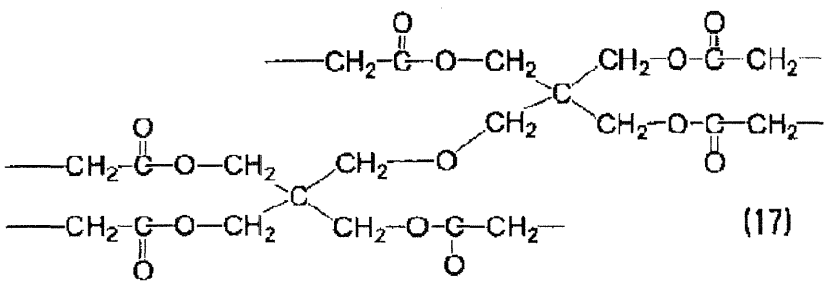
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(16)



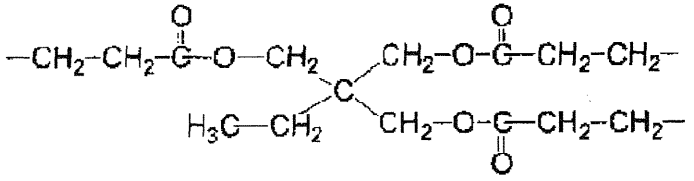
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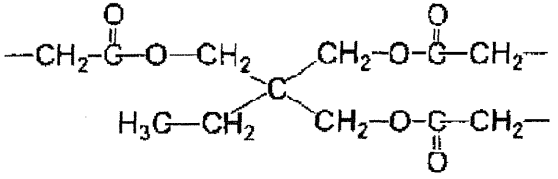
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[Claim 14]

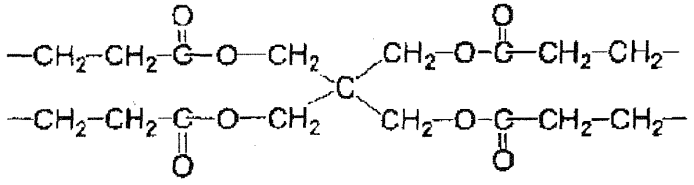
The dispersion composition according to any one of claims 1 to 13, wherein R^1, R^3 or R^6 is the following (1), (2), (10), (11), (16) or (17):



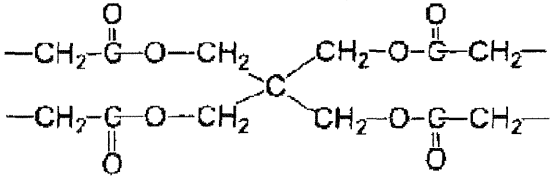
(1)



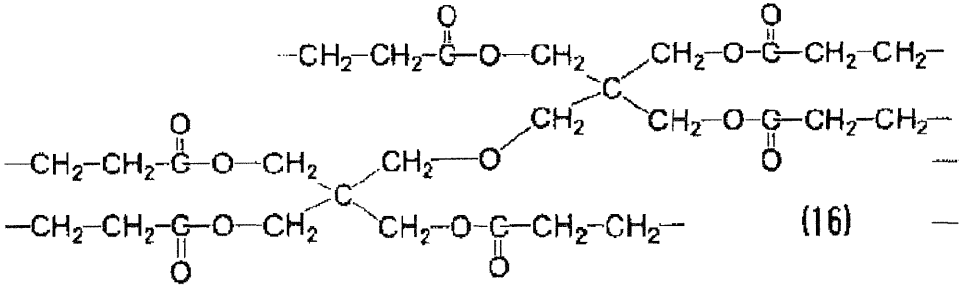
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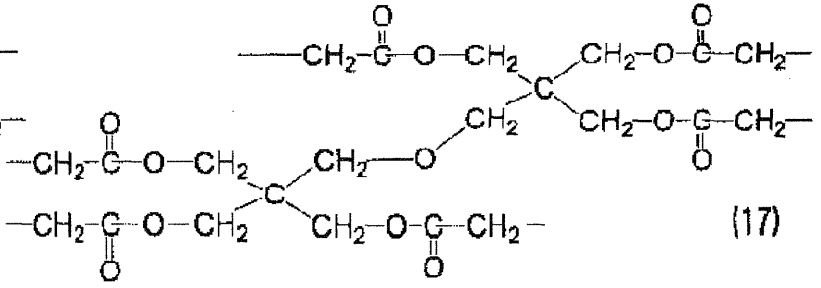
(10)



(11)



(16)



(17)

[Claim 15]

A curable composition comprising the dispersion composition according to any one of claims 1 to 14 and a polymerizable compound (D).

[Claim 16]

The curable composition according to claim 15,

wherein the polymerizable compound (D) is at least one selected from the group consisting of a compound having two or more epoxy groups or oxetanyl groups in a molecular and a compound having two or more terminal ethylenically unsaturated bonds in a molecule.

[Claim 17]

The curable composition according to claim 15 or 16, further comprising at least one selected from the group consisting of a polymerization initiator (E) and a binder polymer.

[Claim 18]

The curable composition according to claim 17,

wherein the polymerization initiator (E) is an oxime-based polymerization initiator.

[Claim 19]

The curable composition according to any one of claims 15 to 18, wherein the composition is for forming a microlens or for forming an undercoat film of a color filter.

[Claim 20]

A transparent film formed by using the curable composition according to any one of claims 15 to 19.

[Claim 21]

A microlens formed by using a transparent film obtained by the curable composition of claim 19.

[Claim 22]

A solid-state imaging device comprising the microlens according to claim 21.

[Claim 23]

A method for preparing the dispersion composition according to any one of claims 1 to 14.

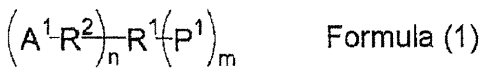
CLAIMS

1. A dispersion composition comprising:

a metal oxide particle (A) having a primary particle diameter of 1 nm to 100 nm;

a polymer compound (B) having an acid value of less than 120 mgKOH/g and being represented by Formula (1); and

a solvent (C):



Formula (1)

wherein, in Formula (1),

R^1 represents a (m+n)-valent linking group,

R^2 represents a single bond or a divalent linking group,

A^1 represents a monovalent substituent having at least one group selected from the group consisting of an acid group, a urea group, a urethane group, a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, an imide group, an alkyloxycarbonyl group, an alkyl amino carbonyl group, a carboxylate group, a sulfonamide group, a heterocyclic group, an alkoxysilyl group, an epoxy group, an isocyanate group, and a hydroxyl group,

n A^1's and n R^2's may be the same or different,

m represents a positive number of 8 or less, n represents 1 to 9, and m+n satisfies 3 to 10, and

P^1 represents a polymer chain, and m P^1's may be the same or different.

2. The dispersion composition according to claim 1,

wherein the polymer compound (B) has a weight average molecular weight of 5,000 to 8,000.

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

wherein the polymer compound (B) has an acid value of 70 to 90 mgKOH/g.

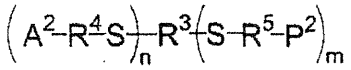
4. The dispersion composition according to any one of claims 1 to 3,

wherein a content of the metal oxide particle (A) is 65% by mass or more with respect

to a total solid content of the dispersion composition.

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

wherein the polymer compound (B) is a polymer compound represented by Formula (2):



Formula (2)

wherein, in Formula (2),

R^3 represents a (m+n)-valent linking group,

R^4 and R^5 each independently represent a single bond or a divalent linking group,

A^2 represents a monovalent substituent having at least one group selected from the group consisting of an acid group, a urea group, a urethane group, a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, an imide group, an alkyloxycarbonyl group, an alkyl amino carbonyl group, a carboxylate group, a sulfonamide group, a heterocyclic group, an alkoxysilyl group, an epoxy group, an isocyanate group, and a hydroxyl group,

n A^2's and n R^4's may be the same or different,

m represents a positive number of 8 or less, n represents 1 to 9, and m+n satisfies 3 to 10, and

P^2 represents a polymer chain, and P^2's and m R^5's may be the same or different.

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

wherein A^1 in Formula (1) or A^2 in Formula (2) is a monovalent substituent having at least one group selected from the group consisting of an acid group, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, a hydroxyl group, a urea group, a urethane group, a sulfonamide group, an imide group and a group having a coordinating oxygen atom.

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

wherein A^1 in Formula (1) or A^2 in Formula (2) is a monovalent substituent having at least one functional group with a pKa of 5 or more.

8. The dispersion composition according to claim 7,

wherein the functional group with a pKa of 5 or more is a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, a urea group, a urethane group, an alkyl group, an aryl group, an alkyloxycarbonyl group, an alkyl aminocarbonyl group, a group having an alkyleneoxy chain, an imide group, a carboxylate group, a sulfonamide group, a hydroxyl group or a heterocyclic group.

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

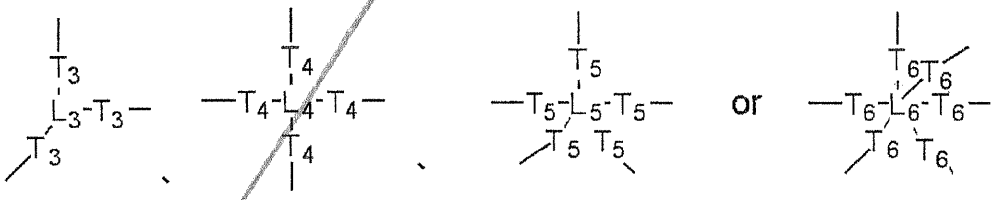
wherein the polymer chain represented by P^1 or P^2 is a polymer chain derived from at least one selected from a polymer or copolymer of vinyl monomers, an ester-based polymer, an ether-based polymer, a urethane-based polymer, an amide-based polymer, an epoxy-based polymer, a silicone-based polymer and a modified product or copolymer thereof.

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

wherein the polymer chain represented by P^1 or P^2 contains at least one repeating unit, and a repeating number k of the at least one repeating unit is 3 to 60.

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

wherein R^1 in Formula (1) or R^3 in Formula (2) is a group represented by any one of the following Formulae:



wherein, in the above Formulae,

L_3 represents a trivalent group

T_3 represents a single bond or a divalent linking group, and three T_3's may be the same or different,

L_4 represents a tetravalent group,

T_4 represents a single bond or a divalent linking group, and four T_4's may be the same or different,

L_5 represents a pentavalent group,

T_5 represents a single bond or a divalent linking group, and five T_5's may be the same

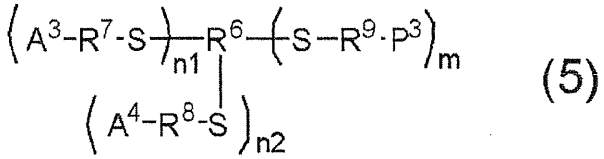
or different,

L_6 represents a hexavalent group, and

T_6 represents a single bond or a divalent linking group, and six T_6's may be the same or different.

12. The dispersion composition according to any one of claims 1 to 11,

wherein the polymer compound (B) is a polymer compound represented by Formula (5):



(5)

wherein, in Formula (5),

R^6 represents a (m+n1+n2)-valent linking group,

R^7 to R^9 each independently represent a single bond or a divalent linking group,

A^3 represents a monovalent substituent having at least one acid group,

A^4 represents a monovalent substituent different from A^3,

n1 A^3's and n1 R^7's may be the same or different,

n2 A^4's and n2 R^8's may be the same or different,

m represents a positive number of 8 or less, n1 represents 1 to 8, n2 represents 1 to 8, and m+n1+n2 satisfies 3 to 10, and

P^3 represents a polymer chain, and m P^3's and m R^9's may be the same or different.

13. A curable composition comprising the dispersion composition according to any one of claims 1 to 12 and a polymerizable compound (D).

14. The curable composition according to claim 13,

wherein the polymerizable compound (D) is at least one selected from the group consisting of a compound having two or more epoxy groups or oxetanyl groups in a molecular and a compound having two or more terminal ethylenically unsaturated bonds in a molecule.

15. The curable composition according to claim 13 or 14, further comprising at least one selected from the group consisting of a polymerization initiator (E) and a binder polymer.

16. The curable composition according to claim 15,
wherein the polymerization initiator (E) is an oxime-based polymerization initiator.

17. The curable composition according to any one of claims 13 to 16, wherein the composition is for forming a microlens or for forming an undercoat film of a color filter.

18. A transparent film formed by using the curable composition according to any one of claims 13 to 17.

19. A microlens formed by using a transparent film obtained by the curable composition of claim 17.

20. A solid-state imaging device comprising the microlens according to claim 19.

21. A method for preparing the dispersion composition according to any one of claims 1 to 12.

Article 34 PCT Amendment

CLAIMS

1. A dispersion composition comprising:

a metal oxide particle (A) having a primary particle diameter of 1 nm to 100 nm;

a polymer compound (B) having an acid value of less than 120 mgKOH/g and being represented by ~~Formula (1)~~ Formula (5); and

a solvent (C):

~~$\left(A^1\text{-}R^2\right)_n R^1\left(P^1\right)_m$ Formula (1)~~

~~wherein, in Formula (1),~~

~~R^1 represents a (m+n)-valent linking group,~~

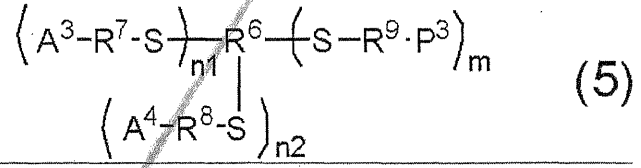
~~R^2 represents a single bond or a divalent linking group,~~

~~A^1 represents a monovalent substituent having at least one group selected from the group consisting of an acid group, a urea group, a urethane group, a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, an imide group, an alkyloxycarbonyl group, an alkyl amino carbonyl group, a carboxylate group, a sulfonamide group, a heterocyclic group, an alkoxysilyl group, an epoxy group, an isocyanate group, and a hydroxyl group,~~

~~n A^1's and n R^2's may be the same or different,~~

~~m represents a positive number of 8 or less, n represents 1 to 9, and m+n satisfies 3 to 10, and~~

~~P^1 represents a polymer chain, and m P^1's may be the same or different.~~



(5)

wherein, in Formula (5),

R^6 represents a (m+n1+n2)-valent linking group selected from structures (1) to (17),

R^7 to R^9 each independently represent a single bond or a divalent linking group,

A^3 represents a monovalent substituent having at least one acid group,

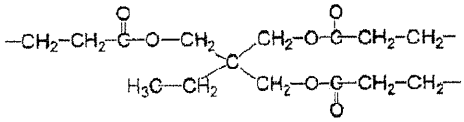
A^4 represents a monovalent substituent different from A^3,

n1 A^3's and n1 R^7's may be the same or different,

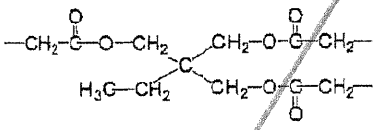
n2 A^4's and n2 R^8's may be the same or different,

m represents a positive number of 8 or less, n1 represents 1 to 8, n2 represents 1 to 8, and m+n1+n2 satisfies 3 to 10, and

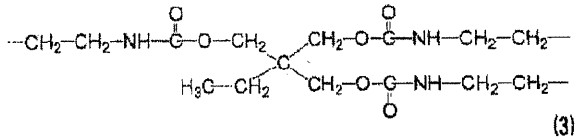
P^3 represents a polymer chain, and m P^3's and m R^9's may be the same or different:



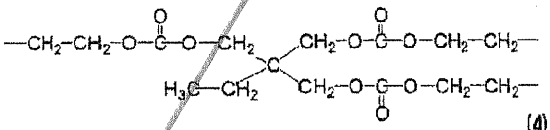
(1)



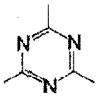
(2)



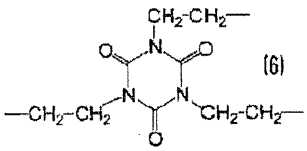
(3)



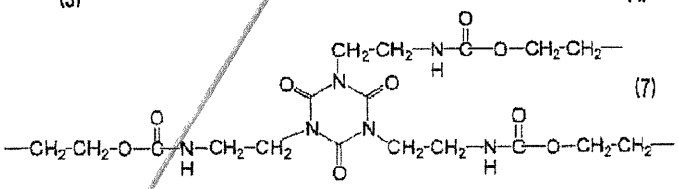
(4)



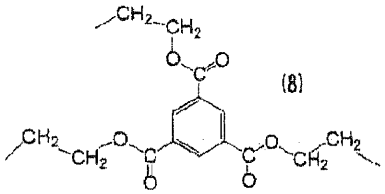
(5)



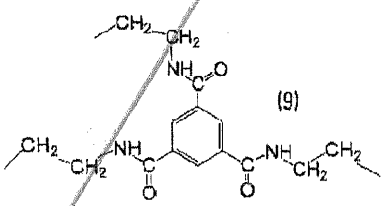
(6)



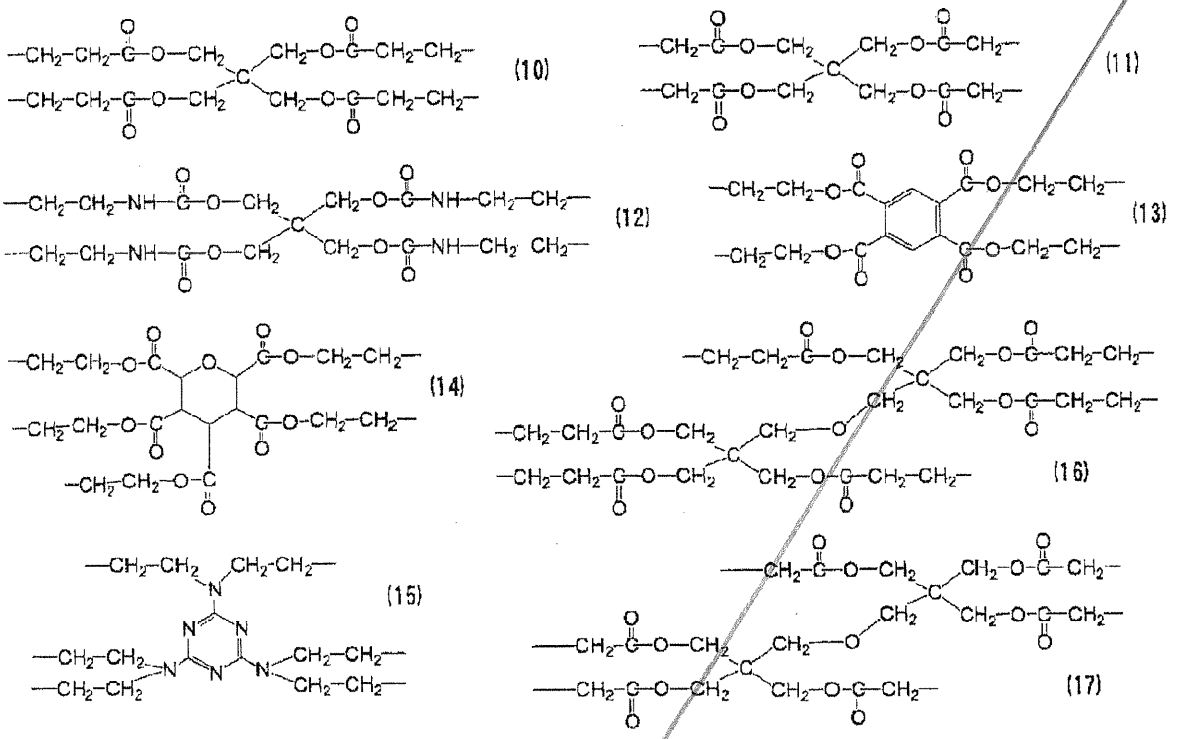
(7)



(8)



(9)



2 (new).The dispersion composition according to claim 1,

wherein the metal oxide particle(A) is a particle surface-treated with an organic compound.

3 (new).The dispersion composition according to claim 2,

wherein the organic compound is a stearic acid.

4 (new).The dispersion composition according to any one of claims 1 to 3,

wherein A^3 is a monovalent substituent having at least one acid group with pKa of less than 5, and

A^4 is a monovalent substituent having at least one functional group with pKa of 5 or more.

~~2~~5. The dispersion composition according to ~~claim 1~~ any one of claims 1 to 4,

wherein the polymer compound (B) has a weight average molecular weight of 5,000 to 8,000.

~~3~~6. The dispersion composition according to ~~claim 1 or 2~~ any one of claims 1 to 5, wherein the polymer compound (B) has an acid value of 70 to 90 mgKOH/g.

~~4~~7. The dispersion composition according to any one of ~~claims 1 to 3~~ claims 1 to 6,

wherein a content of the metal oxide particle (A) is 65% by mass or more with respect to a total solid content of the dispersion composition.

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

~~wherein the polymer compound (B) is a polymer compound represented by Formula (2):~~

~~$\left(A^2\text{-}R^4\text{-}S\right)_n R^3\left(S\text{-}R^5\text{-}P^2\right)_m$ Formula (2)~~

~~wherein, in Formula (2),~~

~~R^3 represents a (m+n)-valent linking group,~~

~~R^4 and R^5 each independently represent a single bond or a divalent linking group,~~

~~A^2 represents a monovalent substituent having at least one group selected from the group consisting of an acid group, a urea group, a urethane group, a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, an imide group, an alkyloxycarbonyl group, an alkylaminocarbonyl group, a carboxylate group, a sulfonamide group, a heterocyclic group, an alkoxysilyl group, an epoxy group, an isocyanate group, and a hydroxyl group,~~

~~n A^2's and n R^4's may be the same or different,~~

~~m represents a positive number of 8 or less, n represents 1 to 9, and m+n satisfies 3 to 10, and~~

~~P^2 represents a polymer chain, and P^2's and m R^5's may be the same or different.~~

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

~~wherein A^1 in Formula (1) or A^2 in Formula (2) is a monovalent substituent having at least one group selected from the group consisting of an acid group, a phenol group, an alkyl group, an aryl group, a group having an alkyleneoxy chain, a hydroxyl group, a urea group, a urethane group, a sulfonamide group, an imide group and a group having a coordinating~~

~~oxygen atom.~~

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

~~wherein A^1 in Formula (1) or A^2 in Formula (2) is a monovalent substituent having at least one functional group with a pKa of 5 or more.~~

~~8. The dispersion composition according to claim 7,~~

~~wherein the functional group with a pKa of 5 or more is a group having a coordinating oxygen atom, a group having a basic nitrogen atom, a phenol group, a urea group, a urethane group, an alkyl group, an aryl group, an alkyloxycarbonyl group, an alkyl amino carbonyl group, a group having an alkyleneoxy chain, an imide group, a carboxylate group, a sulfonamide group, a hydroxyl group or a heterocyclic group.~~

~~9~~8. The dispersion composition according to any one of ~~claims 1 to 8~~ claims 1 to 7,

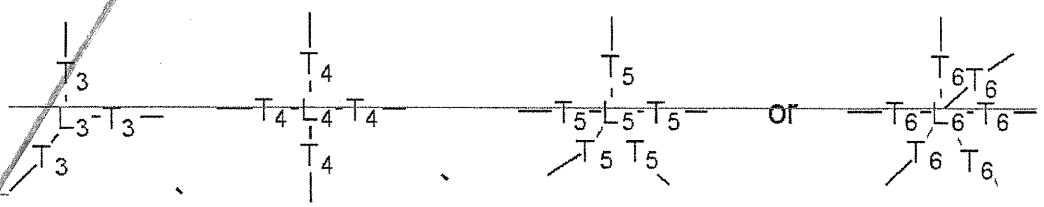
wherein the polymer chain represented by ~~P^1 or P^2~~-P^3 is a polymer chain derived from at least one selected from a polymer or copolymer of vinyl monomers, an ester-based polymer, an ether-based polymer, a urethane-based polymer, an amide-based polymer, an epoxy-based polymer, a silicone-based polymer and a modified product or copolymer thereof.

~~10~~9. The dispersion composition according to any one of ~~claims 1 to 9~~ claims 1 to 8,

wherein the polymer chain represented by ~~P^1 or P^2~~-P^3 contains at least one repeating unit, and a repeating number k of the at least one repeating unit is 3 to 60.

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

~~wherein R^1 in Formula (1) or R^3 in Formula (2) is a group represented by any one of the following Formulae:~~



~~wherein, in the above Formulae,~~

~~L_3 represents a trivalent group~~

~~T_3 represents a single bond or a divalent linking group, and three T_3's may be the same or different,~~

~~L_4 represents a tetravalent group,~~

~~T_4 represents a single bond or a divalent linking group, and four T_4's may be the same or different,~~

~~L_5 represents a pentavalent group,~~

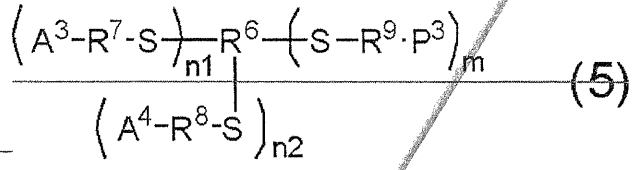
~~T_5 represents a single bond or a divalent linking group, and five T_5's may be the same or different,~~

~~L_6 represents a hexavalent group, and~~

~~T_6 represents a single bond or a divalent linking group, and six T_6's may be the same or different.~~

~~12. The dispersion composition according to any one of claims 1 to 11,~~

~~wherein the polymer compound (B) is a polymer compound represented by Formula (5):~~



~~(5)~~

~~wherein, in Formula (5),~~

~~R^6 represents a (m+n1+n2)-valent linking group,~~

~~R^7 to R^9 each independently represent a single bond or a divalent linking group,~~

~~A^3 represents a monovalent substituent having at least one acid group,~~

~~A^4 represents a monovalent substituent different from A^3,~~

~~n1 A^3's and n1 R^7's may be the same or different,~~

~~n2 A^4's and n2 R^8's may be the same or different,~~

~~m represents a positive number of 8 or less, n1 represents 1 to 8, n2 represents 1 to 8, and m+n1+n2 satisfies 3 to 10, and~~

~~P^3 represents a polymer chain, and m P^3's and m R^9's may be the same or different.~~

~~13~~10. A curable composition comprising the dispersion composition according to any one of ~~claims 1 to 12~~ claims 1 to 9 and a polymerizable compound (D).

~~14~~11. The curable composition according to ~~claim 13~~ claim 10,

wherein the polymerizable compound (D) is at least one selected from the group consisting of a compound having two or more epoxy groups or oxetanyl groups in a molecular and a compound having two or more terminal ethylenically unsaturated bonds in a molecule.

~~15~~12. The curable composition according to ~~claim 13 or 14~~ claim 10 or 11, further comprising at least one selected from the group consisting of a polymerization initiator (E) and a binder polymer.

~~16~~13. The curable composition according to ~~claim 15~~ claim 12,

wherein the polymerization initiator (E) is an oxime-based polymerization initiator.

~~17~~14. The curable composition according to any one of ~~claims 13 to 16~~ claims 10 to 13, wherein the composition is for forming a microlens or for forming an undercoat film of a color filter.

~~18~~15. A transparent film formed by using the curable composition according to any one of ~~claims 13 to 17~~ claims 10 to 14.

~~19~~16. A microlens formed by using a transparent film obtained by the curable composition of ~~claim 17~~ claim 14.

~~20~~17. A solid-state imaging device comprising the microlens according to ~~claim 19~~ claim 16.

~~21~~18. A method for preparing the dispersion composition according to any one of ~~claims 1 to 12~~ claims 1 to 9.