CLAIMS

1. A polymerizable composition, comprising:

a polymerization initiator;

a polymerizable compound;

a tungsten compound; and

an alkali-soluble binder.

2. The polymerizable composition according to claim 1,

wherein the alkali-soluble binder has an acid group and a crosslinking group.

3. The polymerizable composition according to claim 1,

wherein the alkali-soluble binder is a urethane-based resin.

4. The polymerizable composition according to claim 3,

wherein the urethane-based resin is a urethane-based resin having, as the basic structure, a structure unit represented by a reaction product between at least one diisocyanate compound represented by formula (1) and at least one diol compound represented by formula (2):

OCN-X-NCO (1)

$HO\text{-}L^1\text{-}OH$ (2)

wherein in formulae (1) and (2), each of X and L^1 independently represents a divalent organic residue.

5. The polymerizable composition according to claim 1,

wherein the alkali-soluble binder is a (meth)acrylic resin.

6. The polymerizable composition according to any one of claims 1 to 5, wherein the tungsten compound is represented by the following formula (I):

$$M_xW_yO_z \qquad (I)$$

wherein M represents a metal;

W represents tungsten;

O represents oxygen;

$0.001 \leq x/y \leq 1.1$; and

$2.2 \leq z/y \leq 3.0$.

7. The polymerizable composition according to claim 6,

wherein M is an alkali metal.

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

wherein the polymerizable compound is a polyfunctional polymerizable compound having a plurality of polymerizable groups within a molecule.

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

wherein the polymerization initiator is an acetophenone-based compound.

10. The polymerizable composition according to any one of claim 1 to 8,

wherein the polymerization initiator is an oxime compound represented by the group consisting of 1,2-octanedione,1-[4-(phenylthio)-,2-(O-benzoyloxime)], and ethanone,1-[9-ethyl-6-(2-methylbenzoyl)-9H-carbazol-3-yl]-,1-(O-acetyloxime).

11. The polymerizable composition according to any one of claims 1 to 10, further comprising a filler,

wherein the filler is a silica.

12. The polymerizable composition according to any one of claims 1 to 10, further comprising:

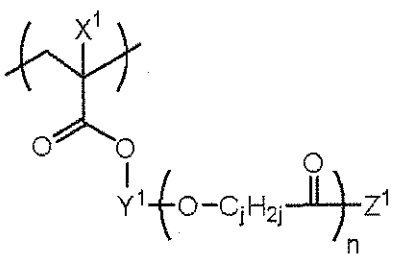
at least two kinds of fillers having different volume average particle diameters of primary particles.

13. The polymerizable composition according to any one of claims 1 to 12, further comprising:

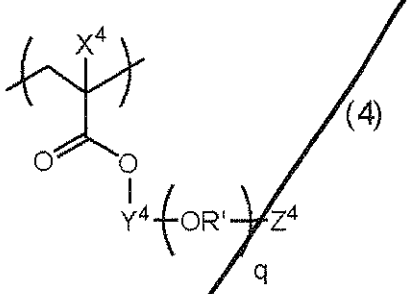
a silane coupling agent.

14. The polymerizable composition according to any one of claims 1 to 13, further comprising a dispersant,

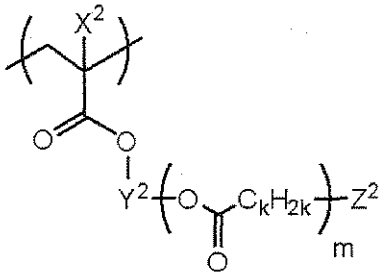
wherein the dispersant has contains a structural unit represented by any one of formulae (1) to (5):



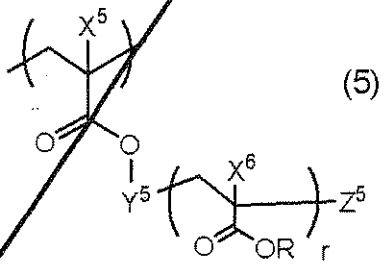
(1)



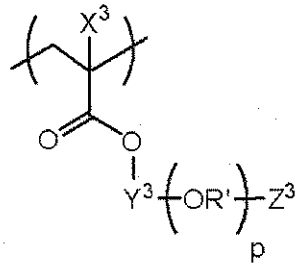
(4)



(2)



(5)



(3)

wherein, in formulae (1) to (5), each of X^1, X^2, X^3, X^4, X^5 and X^6 independently represents a hydrogen atom or a monovalent organic group,

each of Y^1, Y^2, Y^3, Y^4 and Y^5 independently represents a divalent linking group,

each of Z^1, Z^2, Z^3, Z^4 and Z^5 independently represents a hydrogen atom or a monovalent substituent,

each of n, m, p, q and r represents an integer of 1 to 500,

in formulae (1) and (2), each of j and k independently represents an integer of 2 to 8,

in formulae (3) and (4), R' represents a branched or linear alkylene group, and

in formula (5), R represents a hydrogen atom or a monovalent organic group

15. The polymerizable composition according to any one of claims 1 to 14, further comprising a rubber-modified epoxy resin.

16. The polymerizable composition according to any one of claim 1 to 15,

further comprising a crosslinking agent.

17. The polymerizable composition according to any one of claims 1 to 16, further comprising a curing accelerator.

18. The polymerizable composition according to any one of claims 1 to 17, which is used for a solder resist.

19. The polymerizable composition according to claim 18, which has a solid content concentration of from 30 to 80 mass% and a viscosity at 25°C of from 500 to 1500 mPa·s.

CLAIMS

1. A polymerizable composition, comprising:
a polymerization initiator;
a polymerizable compound;
a tungsten compound;
an alkali-soluble binder;
and a filler,
wherein the polymerizable composition has a viscosity at 25° C. of 700 to 1400 mPa·s and the polymerization initiator is an acetophenone-based compound.

2. The polymerizable composition according to claim 1, wherein the alkali-soluble binder has an acid group and a crosslinking group.

3. The polymerizable composition according to claim 1, wherein the alkali-soluble binder is a urethane-based resin.

4. The polymerizable composition according to claim 1, wherein the alkali-soluble binder is a (meth)acrylic resin.

5. The polymerizable composition according to claim 1, wherein the tungsten compound is represented by the following formula (1):

$$M_xW_yO_z \qquad (I)$$

wherein M represents a metal;
W represents tungsten;
O represents oxygen;
$0.001 \leq x/y \leq 1.1$; and
$2.2 \leq z/y \leq 3.0$.

6. The polymerizable composition according to claim 5, wherein M is an alkali metal.

7. The polymerizable composition according to claim 1, wherein the polymerizable compound is

a polyfunctional polymerizable compound having a plurality of polymerizable groups within a molecule.

8. The polymerizable composition according to claim 1, wherein the filler includes at least two kinds of fillers having different volume average particle diameters of primary particles.

9. The polymerizable composition according to claim 1, further comprising: a silane coupling agent.

10. A solder resist comprising a polymerizable composition comprising:
a polymerization initiator;
a polymerizable compound;
a tungsten compound;
an alkali-soluble binder;
and a filler,
wherein the polymerizable composition has a viscosity at 25 C. of 700 to 1400 mPa·s.

11. The solder resist according to claim 10, wherein the polymerizable composition has a solid content concentration of from 30 to 80 mass %.

12. The polymerizable composition according to claim 3, wherein the urethane-based resin is a urethane-based resin having, as the basic structure, a structure unit represented by a reaction product between at least one diisocyanate compound represented by formula (1) and at least one diol compound represented by formula (2):

OCN--X--NCO (1)

HO-L^1-OH (2)

wherein in formulae (1) and (2), each of X and L^1 independently represents a divalent organic residue.

13. A polymerizable composition comprising:
a polymerization initiator;
a polymerizable compound;

a tungsten compound;

an alkali-soluble binder; and

a filler,

wherein:

the polymerizable composition has a viscosity at 25° C. of 700 to 1400 mPa·s, and

the polymerization initiator is an oxime compound selected from the group consisting of 1,2-octanedione,1-[4-(phenylthio)-, 2-(O-benzoyloxime)] and ethanone, 1-[9-ethyl-6-(2-methylbenzoyl)-9H-carbazol-3-yl]-, 1-(O-acetyloxime).

14. The polymerizable composition according to claim 1, wherein the filler is a silica.

15. A polymerizable composition comprising:

a polymerization initiator;

a polymerizable compound;

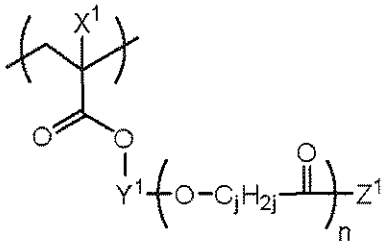
a tungsten compound; an alkali-soluble binder;

a filler; and

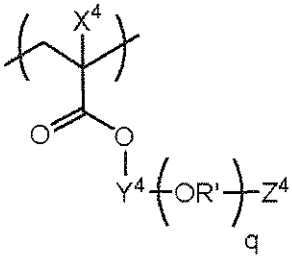
a dispersant,

wherein:

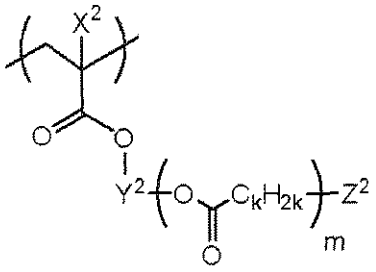
the polymerizable composition has a viscosity at 25° C. of 700 to 1400 mPa·s, and the dispersant has a structural unit represented by any one of formulae (1) to (5):



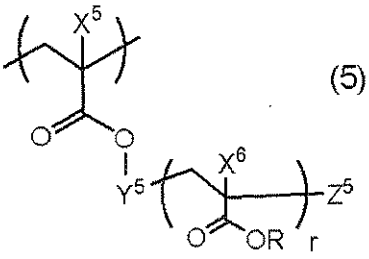
(1)



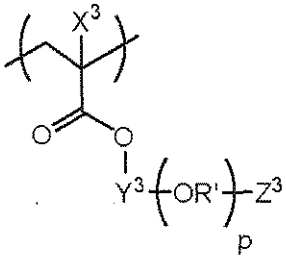
(4)



(2)



(5)



(3)

wherein, in formulae (1) to (5), each of X^1, X^2, X^3, X^4, X^5 and X^6 independently represents a hydrogen atom or a monovalent organic group, each of Y^1, Y^2, Y^3, Y^4 and Y^5 independently represents a divalent linking group, each of Z^1, Z^2, Z^3, Z^4 and Z^5 independently represents a hydrogen atom or a monovalent substituent, each of n, m, p, q and r represents an integer of 1 to 500, in formulae (1) and (2), each of j and k independently represents an integer of 2 to 8, in formulae (3) and (4), R' represents a branched or linear alkylene group, and in formula (5), R represents a hydrogen atom or a monovalent organic group.

16. A polymerizable composition comprising:

a polymerization initiator;

a polymerizable compound;

a tungsten compound;

an alkali-soluble binder;

a filler; and

a rubber-modified epoxy resin, wherein the polymerizable composition has a viscosity at 25° C. of 700 to 1400 mPa·s.

17. The polymerizable composition according to claim 1, further comprising a crosslinking agent.

18. The polymerizable composition according to claim 1, further comprising a curing accelerator.

19. A polymerizable composition comprising:
a polymerization initiator;
a polymerizable compound;
a tungsten compound;
an alkali-soluble binder; and
a filler.
wherein the polymerizable composition has a viscosity at 25° C. of 700 to 1400 mPa·s and the filler is a spherical filler surface-treated with a silane coupling agent.

20. The polymerizable composition according to claim 1, wherein a content of the filler is 1 to 60% by mass based on an entire solid content of the polymerizable composition.

21. The solder resist according to claim 10, wherein the alkali-soluble binder has an acid group and a crosslinking group.

22. The solder resist according to claim 10, wherein the alkali-soluble binder is a urethane-based resin.

23. The solder resist according to claim 10, wherein the alkali-soluble binder is a (meth)acrylic resin.

24. The solder resist according to claim 10, wherein the tungsten compound is represented by the following formula (1):

$M_xW_yO_z$ (I)

wherein M represents a metal; W represents tungsten; O represents oxygen;

$0.001 \leq x/y \leq 1.1$; and

$2.2 \leq z/y \leq 3.0$.

25. The solder resist according to claim 10, wherein M is an alkali metal.

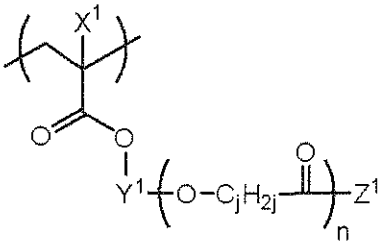
26. The solder resist according to claim 10, wherein the polymerizable compound is a polyfunctional polymerizable compound having a plurality of polymerizable groups within a molecule.

27. The solder resist according to claim 10, wherein the polymerization initiator is an acetophenone-based compound.

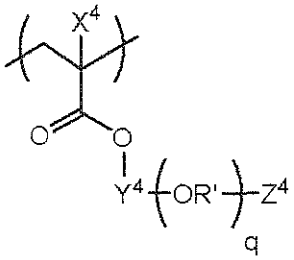
28. The solder resist according to claim 10, wherein the filler includes at least two kinds of fillers having different volume average particle diameters of primary particles.

29. The solder resist according to claim 10, further comprising: a silane coupling agent.

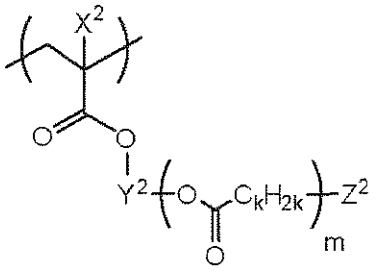
30. The solder resist according to claim 10, further comprising a dispersant, wherein the dispersant has a structural unit represented by any one of formulae (1) to (5):



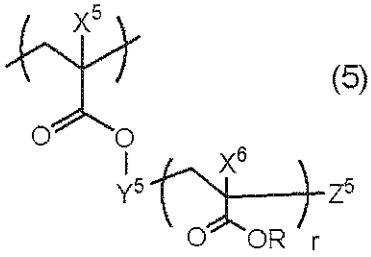
(1)



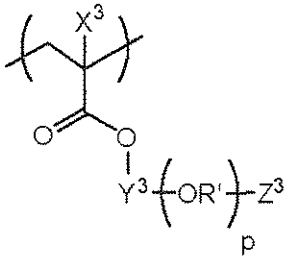
(4)



(2)



(5)



(3)

wherein, in formulae (1) to (5), each of X^1, X^2, X^3, X^4, X^5 and X^6 independently represents a hydrogen atom or a monovalent organic group, each of Y^1, Y^2, Y^3, Y4 and Y^5 independently represents a divalent linking group, each of Z^1, Z^2, Z^3, Z^4 and Z^5 independently represents a hydrogen atom or a monovalent substituent, each of n, m, p, q and r represents an integer of 1 to 500,

in formulae (1) and (2), each of j and k independently represents an integer of 2 to 8,

in formulae (3) and (4), R' represents a branched or linear alkylene group, and

in formula (5), R represents a hydrogen atom or a monovalent organic group.