~~Patent Claims~~

CLAIMS

1. A substrate pattern filling composition comprising a first solute (A), a second solute (B) and a solvent (C),
wherein
the first solute (A) comprises at least any one of an amino group, a hydroxy group or a carbonyl group, provided that the first solute has at most one hydroxy group per molecule;
the second solute (B) comprises at least any one of an amino group, a hydroxy group or a carbonyl group, provided that the second solute has at most one hydroxy group per molecule;
the first solute (A) and the second solute (B) are different substances; and

~~preferably,~~ the first solute (A) and/or the second solute (B) each independently comprises a 5-membered or 6-membered hydrocarbon ring or heterocyclic ring~~.~~ and

wherein the sum of the mass of the first solute (A) and the mass of the second solute (B) is 1 to 40 mass% based on the mass of the substrate pattern filling composition.

2. The composition according to claim 1, wherein a film is formed from the substrate pattern filling composition filled in the substrate pattern, and the first solute (A) and/or the second solute (B) are independently vaporized to remove the film from the substrate pattern;
~~preferably, the vaporization is sublimation; and~~
~~preferably, when removing the film formed from the substrate pattern filling composition, heating (more preferably 70°C or higher) and/or pressure reduction (more preferably 80 kPa or lower) are not performed.~~

~~3. The composition according to claim 1 or 2~~and when removing the film formed from the substrate pattern filling composition, heating and/or pressure reduction are not performed.

3. The composition according to claim 1, wherein a film is formed from the substrate pattern filling composition filled in the substrate pattern, and the first solute (A) and/or the second solute (B) are independently vaporized to remove the film from the substrate pattern;
wherein the vaporization is sublimation; and
when removing the film formed from the substrate pattern filling composition, heating at 70°C or higher and/or pressure reduction at 80 kPa or lower are not performed.

4. The composition according to claim 1, wherein the amino group and/or the carbonyl group in the first solute (A) and/or the second solute (B) are each independently a part of the ring in the hydrocarbon ring or the heterocyclic ring, and the hydroxy group is directly added to the ring in the hydrocarbon ring or the heterocyclic ring~~;~~
~~preferably,~~.

5. The composition according to claim 1, wherein the amino group and/or the carbonyl group in the first solute (A) and/or the second solute (B) are each independently a part of the ring in the hydrocarbon ring or the heterocyclic ring, and the hydroxy group is directly added to the ring in the hydrocarbon ring or the heterocyclic ring;
wherein the first solute (A) and/or the second solute (B) each independently has a cage-shaped steric mother structure; and
~~preferably,~~
wherein the first solute (A) and/or the second solute (B) each independently has 1 to 5 amino groups, 1 to 3 carbonyl groups, and/or one hydroxy group per molecule.

~~4~~6. The composition according to ~~one or more of claims~~claim 1~~ to 3~~, wherein the molecular weight of the first solute (A) and/or the second solute (B) are each independently 80 to 300.

~~5~~7. The composition according to ~~one or more of claims~~claim 1~~ to 4, ~~,
wherein the ~~sum of the mass of the first solute (A) and the mass of the second solute (B) is 1 to 40 mass% based on the mass of the substrate pattern filling composition;~~
~~preferably, the~~ mass ratio of the first solute (A) : the second solute (B) is 99: 1

to 1 : 99; and

~~preferably,~~

wherein the mass of the solvent (C) is 30 to 99 mass% based on the mass of the substrate pattern filling composition.

~~6~~8. The composition according to ~~one or more of claims~~claim 1~~ to 5~~, wherein the solvent (C) comprises an organic solvent, and the organic solvent comprises at least one selected from the group consisting of alcohols, alkanes, ethers, lactic acid esters, aromatic hydrocarbons, ketones, amides and lactones.

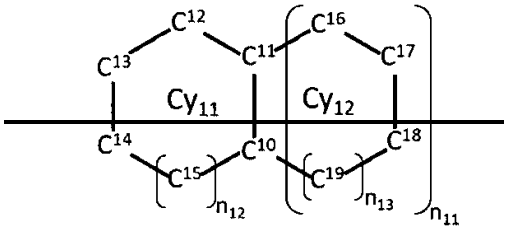
~~7~~9. The composition according to ~~one or more of claims~~claim 1~~ to 6~~, wherein bp_A, bp_B and ~~bp_C~~bpc, which are the boiling points under 1 atm respectively of the first solute (A), the second solute (B) and the solvent (C), satisfy $bp_A > bp_B > bp_C$~~; and~~

~~preferably,~~.

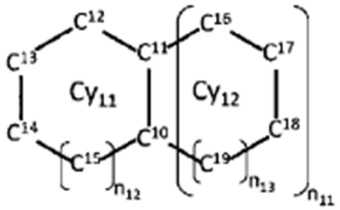
10. The composition according to claim 1, wherein bp_A, bp_B and bp_C, which are the boiling points under 1 atm respectively of the first solute (A), the second solute (B) and the solvent (C), satisfy $bp_A > bp_B > bp_C$; and

wherein vp_A, vp_B and vp_C, which are the saturated vapor pressures at 25°C under 1 atm respectively of the first solute (A), the second solute (B) and the solvent (C), satisfy $vp_A < vp_B < vp_C$.

~~8~~11. The composition according to ~~at least one of claims~~claim 1~~ to 7~~, wherein the first solute (A) is represented by the following formula (A) and the second solute (B) is represented by the following formula (B):



~~formula (A)~~



formula (A)

wherein,

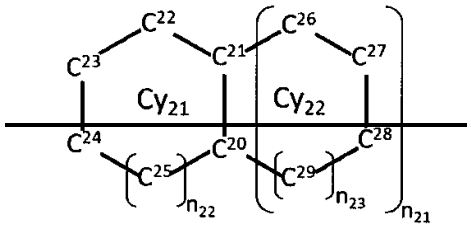
Cy_{11} and Cy_{12} are each independently a saturated or unsaturated hydrocarbon ring or a heterocyclic ring;

C^{n1} is each carbon, n1 is an integer of 10 to 19, and the remaining bonding hand of C^{n1} is bonded with H;

C^{n1} can be each independently replaced with $-C^{n1}R_{n1}-$, ~~$-C^{n1}R_{n1}R_{n1'}-$~~,$\underline{C^{n1}R_{n1}R_{n1'}-}$, $-C^{n1}(OH)-$, $-C^{n1}(=O)-$, $-N^{n1}H-$ and/or $-N^{n1}R_{n1}-$;

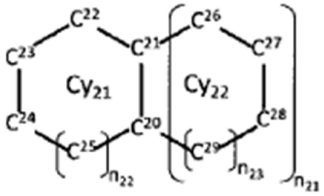
R_{n1} and ~~R_{n1}~~$\underline{R_{n1'}}$ are each independently C_{1-5} alkyl, $-NH_2$ and/or C_{1-5} aminoalkyl, and R_{n1} and/or ~~R_{n1}~~$\underline{R_{n1'}}$ can be combined with another R_{n1}, ~~R_{n1}~~$\underline{R_{n1'}}$ and/or C^{n1} to form a ring; and

n_{11}, n_{12} and n_{13} are each independently 0 or 1, and



~~formula (B)~~

~~.~~



formula (B)

wherein,

Cy_{21} and Cy_{22} are each independently a saturated or unsaturated hydrocarbon ring or a heterocyclic ring;

C^{n2} is each carbon, n2 is an integer of 20 to 29, and the remaining bonding hand of C^{n2} is bonded with H;

~~C^{n2} can be each independently replaced with $-C^{n2}R_{n2}-$, $-C^{n2}R_{n2}R_{n2'}-$, $-C^{n2}(OH)-$, $-C^{n2}(=O)-$, $-N^{n2}H-$ and/or $-N^{n2}R_{n2}-$;~~

~~R_{n2} and $R_{n2'}$ are each independently C_{1-5} alkyl, $-NH_2$ and/or C_{1-5} aminoalkyl, and R_{n2} and/or $R_{n2'}$ can be combined with another R_{n2}, $R_{n2'}$ and/or C^{n2} to form a ring; and~~

~~n_{21}, n_{22} and n_{23} are each independently 0 or 1.~~

~~9~~C^{n2} can be each independently replaced with $-C^{n2}R_{n2}-$, $-C^{n2}R_{n2}R_{n2'}-$, $-C^{n2}(OH)-$, $-C^{n2}(=O)-$, $-N^{n2}H-$ and/or $-N^{n2}R_{n2}-$;

R_{n2} and $R_{n2'}$ are each independently C_{1-5} alkyl, $-NH_2$ and/or C_{1-5} aminoalkyl, and R_{n2} and/or $R_{n2'}$ can be combined with another R_{n2}, $R_{n2'}$ and/or C^{n2} to form a ring; and

n_{21}, n_{22} and n_{23} are each independently 0 or 1.

12. The composition according to ~~one or more of claims 1 to 8~~claim 1, wherein the first solute (A) and the second solute (B) are each independently any of phthalic anhydride, caffeine, melamine, 1,4-benzoquinone, camphor, hexamethylenetetramine, hexahydro-1,3,5-trimethyl-1,3,5-triazine, 1-adamantanol, 1,4-diazabicyclo[2.2.2]octane, borneol, (-)-borneol, (±)-isoborneol, 1,2-cyclohexanedione, 1,3-cyclohexanedione, 1,4-cyclohexanedione, 3-methyl-1,2-cyclopentanedione, (±)-camphorquinone, (-)-camphorquinone, (+)-camphorquinone or 1-adamantaneamine.

~~10~~13. The composition according to ~~one or more of claims~~claim 1~~ to 9~~, further comprising a third solute (D), wherein

~~preferably,~~ the composition further comprises a fourth solute (E); and

bp_D and bp_E, which are the boiling points under 1 atm respectively of the third solute (D) and the fourth solute (E), and vp_D and vp_E, and which are the saturated vapor pressures at 25°C and under 1 atm respectively of the third solute (D) and the fourth solute (E), satisfy:

~~$bp_C < bp_E < bp_D < bp_B < bp_A$, and~~

~~preferably, $vp_A < vp_B < vp_D < vp_E < vp_C$.~~

~~11~~$bp_C < bp_E < bp_D < bp_B < bp_A$.

14. The composition according to ~~one or more~~claim 1, further comprising a third solute (D), wherein
the composition further comprises a fourth solute (E); and
bp_D and bp_E, which are the boiling points under 1 atm respectively of ~~claims 1~~the third solute (D) and the fourth solute (E), and vp_D and vp_E, which are the saturated vapor pressures at 25°C and under 1 atm respectively of the third solute (D) and the fourth solute (E), satisfy:
$bp_C < bp_E < bp_D < bp_B < bp_A$, and
wherein $vp_A < vp_B < vp_D < vp_E < vp_C$.

15. The composition according to ~~10~~claim 1, wherein the substrate pattern is cleaned with a cleaning liquid before applying the substrate pattern filling composition and the composition is used to replace the liquid present on the substrate.

~~12~~16. The composition according to ~~one or more of claims 1 to 11~~claim 13, further comprising ~~an other~~another additive (F), wherein
the other additive (F) comprises a surfactant, an antibacterial agent, a bactericidal agent, an antiseptic agent, an antifungal agent, an acid, and/or a base; and

~~preferably,~~ compared with the sum of the mass of the first solute (A) and the mass of the second solute (B), the other additive (F) is 0 to 20 mass%.

~~13~~17. The composition according to ~~one or more of claims~~claim 1~~ to 12~~, wherein the surface of the substrate on which the pattern to be filled with the composition is present is selected from the group consisting of Si, Ge, SiGe, Si_3N_4, TaN, SiO_2, TiO_2, Al_2O_3, SiON, HfO_2, T_2O_5, $HfSiO_4$, Y_2O_3, GaN, TiN, TaN, Si_3N_4, NbN, Cu, Ta, W, Hf, and Al~~; and~~

~~preferably, the surface of the substrate is a semiconductor~~.

~~14~~18. The composition according to claim 1, wherein the surface of the substrate on which the pattern to be filled with the composition is present is selected from the group consisting of Si, Ge, SiGe, Si_3N_4, TaN, SiO_2, TiO_2, Al_2O_3, SiON, HfO_2, T_2O_5, $HfSiO_4$, Y_2O_3, GaN, TiN, TaN, Si_3N_4, NbN, Cu, Ta, W, Hf, and Al; and
wherein the surface of the substrate is a semiconductor.

19. A method for manufacturing a device comprising filling the composition according to ~~one or more of claims 1 to 13~~claim 1 in a substrate pattern to form a film and vaporizing the film to remove it.

20. A substrate pattern filling composition comprising a first solute (A), a second solute (B) and a solvent (C),
wherein
the first solute (A) comprises at least any one of an amino group, a hydroxy group or a carbonyl group, provided that the first solute has at most one hydroxy group per molecule;
the second solute (B) comprises at least any one of an amino group, a hydroxy group or a carbonyl group, provided that the second solute has at most one hydroxy group per molecule;
the first solute (A) and the second solute (B) are different substances; and
the first solute (A) and/or the second solute (B) each independently comprises a 5-membered or 6-membered hydrocarbon ring or heterocyclic ring and further comprising a third solute (D), wherein

the composition further comprises a fourth solute (E); and
bp_D and bp_E, which are the boiling points under 1 atm respectively of the third solute (D) and the fourth solute (E), and vp_D and vp_E, and which are the saturated vapor pressures at 25°C and under 1 atm respectively of the third solute (D) and the fourth solute (E), satisfy:
$bp_C < bp_E < bp_D < bp_B < bp_A$.