CLAIMS

[Claim 1] A monomer composition, comprising:

methyl methacrylate; and

one compound (component A) selected from an ester compound having an α-hydrogen (component A1) represented by Formula (1-1), an α,β-unsaturated carbonyl compound (component A21) represented by Formula (2-1), an α,β-unsaturated carboxylic acid ester (component A22) represented by Formula (2-2), or a pyrazine compound (component A3) represented by Formula (3-1),

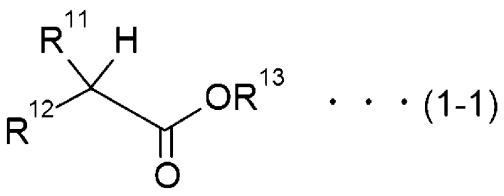
wherein, when the monomer composition contains component A1 and a concentration of component A1 with respect to a total mass of the monomer composition is indicated by XA1 (ppm by mass), XA1 is 5 to 10000 ppm by mass,

when the monomer composition contains component A21 and a concentration of component A21 with respect to the total mass of the monomer composition is indicated by XA21 (ppm by mass), XA21 is 1 to 10000 ppm by mass,

when the monomer composition contains component A22 and a concentration of component A22 with respect to the total mass of the monomer composition is indicated by XA22 (ppm by mass), XA22 is 1 to 10000 ppm by mass, and

when the monomer composition contains component A3 and a concentration of component A3 with respect to the total mass of the monomer composition is indicated by XA3 (ppm by mass), XA3 is 1 ppm by mass or more,

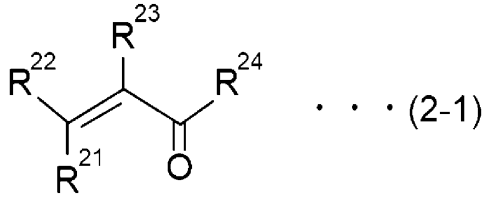
[Chemical Formula 1]



・・・(1-1)

(in Formula (1-1), R^{11} and R^{12} are each independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, R^{13} is an alkyl group having 1 to 5 carbon atoms, and any one or more of R^{11} to R^{13} is an alkyl group having 2 to 5 carbon atoms),

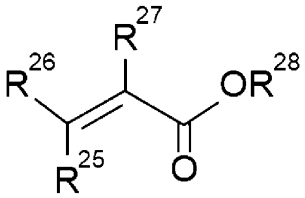
[Chemical Formula 2]



$\cdots(2\text{-}1)$

(in Formula (2-1), R^{21}, R^{22}, and R^{23} are each independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and R^{24} is an alkyl group having 1 to 5 carbon atoms or an amino group),

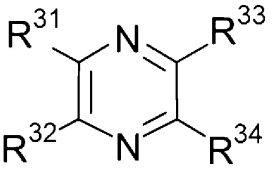
[Chemical Formula 3]



$\cdots(2\text{-}2)$

(in Formula (2-2), R^{25}, R^{26}, and R^{27} are each independently a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, R^{28} is an alkyl group having 1 to 10 carbon atoms, and any one or more of R^{25} and R^{26} is an alkyl group having 1 to 10 carbon atoms),

[Chemical Formula 4]



$\cdots(3\text{-}1)$

(in Formula (3-1), R^{31}, R^{32}, R^{33}, and R^{34} are each independently a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, or an alkoxy group having 1 to 6

carbon atoms).

[Claim 2] The monomer composition according to Claim 1,

wherein component A is component A1,

wherein it is preferred that (i) XA1 is 10 to 5000 ppm by mass and/or

(ii) a molecular weight of component A1 is 200 or less.

[Claim 3] The monomer composition according to Claim 2,

wherein, in Formula (1-1), R^{11} and R^{12} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{13} is a methyl group, an isobutyl group, or an isoamyl group, and

wherein component A1 is preferably at least one selected from the group consisting of isobutyl isobutyrate, methyl isovalerate, and isoamyl isobutyrate.

[Claim 4] The monomer composition according to Claim 1,

wherein component A is component A21,

wherein it is preferred that (i) XA21 is 10 to 5000 ppm by mass and/or

(ii) a molecular weight of component A21 is 200 or less.

[Claim 5] The monomer composition according to Claim 4,

wherein, in Formula (2-1), R^{21}, R^{22}, and R^{23} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{24} is a methyl group or an amino group, and

wherein component A21 is preferably at least one selected from the group consisting of isopropenyl methyl ketone and methacrylamide.

[Claim 6] The monomer composition according to Claim 1,

wherein component A is component A22,

wherein it is preferred that (i) XA22 is 10 to 5000 ppm by mass and/or (ii) a molecular weight of component A22 is 200 or less.

[Claim 7] The monomer composition according to Claim 6,

wherein, in Formula (2-2), R^{25}, R^{26}, and R^{27} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{28} is a methyl group, an ethyl group, an n-propyl group, an isopropyl group, an n-butyl group, an isobutyl group, or an isopentyl group.

wherein component A22 is preferably at least one selected from the group consisting of methyl crotonate and methyl 3,3-dimethylacrylate.

[Claim 8] The monomer composition according to Claim 1,

wherein component A is component A3,

wherein XA3 is preferably 1 to 10000 ppm by mass, more preferably 1 to 1000 ppm by mass.

[Claim 9] The monomer composition according to Claim 8,

wherein a molecular weight of component A3 is 200 or less.

[Claim 10] The monomer composition according toClaims 8 or 9,

wherein, in Formula (3-1), R^{31}, R^{32}, R^{33}, and R^{34} are each independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms,

wherein preferably R^{31}, R^{32}, R^{33}, and R^{34} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and

wherein more preferably component A3 is at least one selected from the group consisting of 2,3,5,6-tetramethylpyrazine and 2,3,5-trimethylpyrazine.

[Claim 11] The monomer composition according to Claim 1, further comprising:

a polymerization inhibitor (component B1), wherein, when a concentration of component B1 with respect to the total mass of the monomer composition is indicated by XB1 (ppm by mass), XB1 is preferably 1 to 2000 ppm, more preferably 1 to 1000 ppm by mass.

[Claim 12] The monomer composition according to Claim 11,

wherein, when the concentration of component A1 with respect to the total mass of the monomer composition is indicated by XA1 (ppm by mass) and a concentration of component B1 with respect to the total mass of the monomer composition is indicated by XB1 (ppm by mass), XB1/XA1 is 0.005 to 7.

[Claim 13] The monomer composition according to Claim 11,

wherein, when the concentration of component A3 with respect to the total mass of the monomer composition is indicated by XA3 (ppm by mass) and a concentration of component B1 with respect to the total mass of the monomer composition is indicated by XB1 (ppm by mass), XB1/XA3 is 0.005 to 1000.

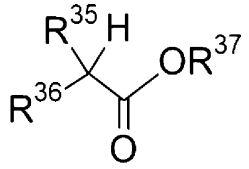
[Claim 14] The monomer composition according to any one of Claims 11 to 13, wherein component B1 is at least one polymerization inhibitor selected from the group consisting of a phenol-based compound, a quinone-based compound, a nitrobenzene-based compound, an N-oxyl-based compound, an amine-based compound, a phosphorus-containing compound, a sulfur-containing compound, an iron-containing compound, a copper-containing compound, and a manganese-containing compound,

wherein preferably component B1 is at least one polymerization inhibitor selected from the group consisting of a phenol-based compound, an N-oxyl-based compound, an amine-based compound, and a sulfur-containing compound.

[Claim 15] The monomer composition according to Claim 8, further comprising:

an ester compound having an α-hydrogen (component B2) represented by Formula (3-2),

[Chemical Formula 5]



· · · (3-2)

(in Formula (3-2), R^{35} and R^{36} are each independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and R^{37} is an alkyl group having 1 to 5 carbon atoms).

[Claim 16] The monomer composition according to Claim 15,

wherein, when a concentration of component B2 with respect to the total mass of the monomer composition is indicated by XB2 (ppm by mass), XB2 is 5 to 10000 ppm by mass.

[Claim 17] The monomer composition according to Claims 15 or 16,

wherein, when a concentration of component B2 with respect to the total mass of the monomer composition is indicated by XB2 (ppm by mass), XB2/XA3 is 0.005 to 1000.

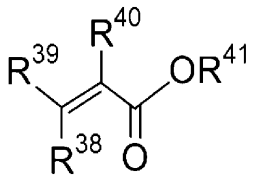
[Claim 18] The monomer composition according to any one of Claims 15 to 17,

wherein, in Formula (3-2), R^{35} and R^{36} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{37} is a methyl group, an ethyl group, an n-propyl group, or an isopropyl group.

[Claim 19] The monomer composition according to Claim 8, further comprising:

an α,β-unsaturated carbonyl compound (component B3) represented by Formula (3-3),

[Chemical Formula 6]



· · · (3-3)

(in Formula (3-3), R^{38}, R^{39}, and R^{40} are each independently a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, and R^{41} is an alkyl group having 1 to 10 carbon atoms).

[Claim 20] The monomer composition according to Claim 19,

wherein, when a concentration of component B3 is indicated by XB3 (ppm by mass), XB3 is 5 to 10000 ppm by mass.

[Claim 21] The monomer composition according to Claims 19 or 20,

wherein, when a concentration of component B3 is indicated by XB3 (ppm by mass), XB3/XA3 is 0.005 to 1000.

[Claim 22] The monomer composition according to any one of Claims 19 to 21,

wherein, in Formula (3-3), R^{38}, R^{39}, and R^{40} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{41} is a methyl group, an ethyl group, an n-propyl group, or an isopropyl group.

[Claim 23] The monomer composition according to any one of Claims 1 to 22,

wherein, when a concentration of the methyl methacrylate with respect to the total mass of the monomer composition is indicated by XM (% by mass), XM is 85% by mass or more.

[Claim 24] The monomer composition according to any one of Claims 1 to 23, further comprising:

an acrylic acid ester,

wherein the acrylic acid ester is preferably at least one selected from the group consisting of methyl acrylate, ethyl acrylate, and n-butyl acrylate.

[Claim 25] The monomer composition according to any one of Claims 1 to 24, further comprising:

styrene.

[Claim 26] A production method for a methacrylic resin composition, comprising:

a step of radically polymerizing a polymerizable composition containing the monomer composition according to any one of Claims 1 to 25.

[Claim 27] A methacrylic resin composition, comprising:

a polymer of the monomer composition according to any one of Claims 1 to 25.

[Claim 28] A methacrylic resin composition, comprising:

a methacrylic polymer; and

one compound (component A) selected from an ester compound having an α-hydrogen (component A1) represented by Formula (1-1), an α,β-unsaturated carbonyl compound (component A21) represented by Formula (2-1), an α,β-unsaturated carboxylic acid ester (component A22) represented by Formula (2-2), or a pyrazine compound (component A3) represented by Formula (3-1),

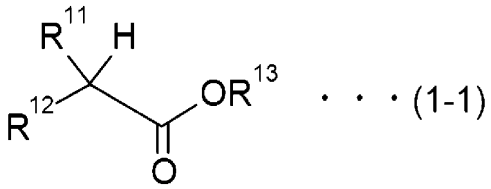
wherein, when the methacrylic resin composition contains component A1 and a concentration of component A1 with respect to a total mass of the methacrylic resin composition is indicated by YA1 (ppm by mass), YA1 is 5 to 10000 ppm by mass,

when the methacrylic resin composition contains component A21 and a concentration of component A21 with respect to the total mass of the methacrylic resin composition is indicated by YA21 (ppm by mass), YA21 is 0.1 to 4000 ppm by mass,

when the methacrylic resin composition contains component A22 and a concentration of component A22 with respect to the total mass of the methacrylic resin composition is indicated by YA22 (ppm by mass), YA22 is 1 to 10000 ppm by mass, and

when the methacrylic resin composition contains component A3 and a concentration of component A3 with respect to the total mass of the methacrylic resin composition is indicated by YA3 (ppm by mass), YA3 is 1 ppm by mass or more,

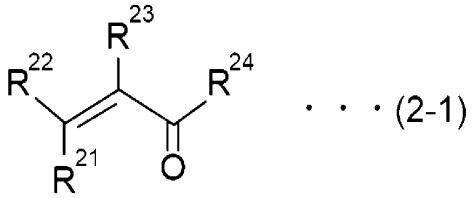
[Chemical Formula 7]



(1-1)

(in Formula (1-1), R^{11} and R^{12} are each independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, R^{13} is an alkyl group having 1 to 5 carbon atoms, and any one or more of R^{11} to R^{13} is an alkyl group having 2 to 5 carbon atoms),

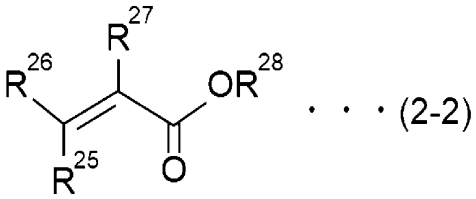
[Chemical Formula 8]



(2-1)

(in Formula (2-1), R^{21}, R^{22}, and R^{23} are each independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and R^{24} is an alkyl group having 1 to 5 carbon atoms or an amino group),

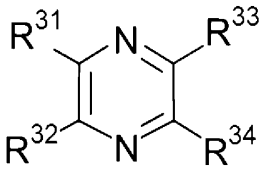
[Chemical Formula 9]



(2-2)

(in Formula (2-2), R^{25}, R^{26}, and R^{27} are each independently a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, R^{28} is an alkyl group having 1 to 10 carbon atoms, and any one or more of R^{25} and R^{26} is an alkyl group having 1 to 10 carbon atoms),

[Chemical Formula 10]



· · · (3-1)

(in Formula (3-1), R^{31}, R^{32}, R^{33}, and R^{34} are each independently a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, or an alkoxy group having 1 to 6 carbon atoms).

[Claim 29] The methacrylic resin composition according to Claim 28, wherein component A is component A1,

wherein YA1 preferably is 10 to 5000 ppm by mass.

[Claim 30] The methacrylic resin composition according to Claim 29, wherein, in Formula (1-1), R^{11} and R^{12} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{13} is a methyl group, an isobutyl group, or an isoamyl group,

wherein component A1 is preferably at least one selected from the group consisting of isobutyl isobutyrate, methyl isovalerate, and isoamyl isobutyrate.

[Claim 31] The methacrylic resin composition according to Claim 28, wherein component A is component A21,

wherein YA21 is preferably 1 to 4000 ppm by mass, more preferably 10 to 1000 ppm by mass.

[Claim 32] The methacrylic resin composition according to Claim 31, wherein, in Formula (2-1), R^{21}, R^{22}, and R^{23} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{24} is a methyl group or an amino group,

wherein component A21 is preferably at least one selected from the group consisting of isopropenyl methyl ketone and methacrylamide.

[Claim 33] The methacrylic resin composition according to Claim 28, wherein component A is component A22,

wherein YA22 is preferably 10 to 5000 ppm by mass.

[Claim 34] The methacrylic resin composition according to Claim 33, wherein, in Formula (2-2), R^{25}, R^{26}, and R^{27} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{28} is a methyl group, an ethyl group, an n-propyl group, an isopropyl group, an n-butyl group, an isobutyl group, or an isopentyl group,

wherein component A22 is preferably at least one selected from the group consisting of methyl crotonate and methyl 3,3-dimethylacrylate.

[Claim 35] The methacrylic resin composition according to Claim 28, wherein component A is component A3,

wherein YA3 is preferably 1 to 10000 ppm by mass, more preferably 1 to 1000 ppm by mass.

[Claim 36] The methacrylic resin composition according to Claim 35,

wherein, in Formula (3-1), R^{31}, R^{32}, R^{33}, and R^{34} are each independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms,

wherein R^{31}, R^{32}, R^{33}, and R^{34} are preferably each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group,

and wherein more preferably component A3 is at least one selected from the group consisting of 2,3,5,6-tetramethylpyrazine and 2,3,5-trimethylpyrazine.

[Claim 37] The methacrylic resin composition according to any one of Claims 28 to 36, further comprising:

a polymerization inhibitor (component B1)

wherein, when a concentration of component B1 with respect to the total mass

of the methacrylic resin composition is indicated by YB1 (ppm by mass), YB1 is preferably 1 to 2000 ppm by mass.

[Claim 38] The methacrylic resin composition according to Claim 37,

wherein, when a concentration of component B1 with respect to the total mass of the methacrylic resin composition is indicated by YB1 (ppm by mass), YB1/YA3 is 0.005 to 1000.

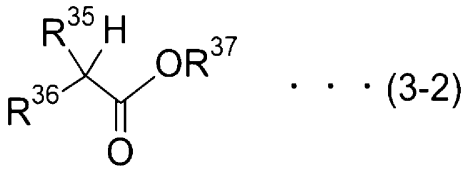
[Claim 39] The methacrylic resin composition according to Claims 37 or 38, wherein component B1 is at least one polymerization inhibitor selected from the group consisting of a phenol-based compound, a quinone-based compound, a nitrobenzene-based compound, an N-oxyl-based compound, an amine-based compound, a phosphorus-containing compound, a sulfur-containing compound, an iron-containing compound, a copper-containing compound, and a manganese-containing compound,

wherein component B1 is preferably at least one polymerization inhibitor selected from the group consisting of a phenol-based compound, an N-oxyl-based compound, an amine-based compound, and a sulfur-containing compound.

[Claim 40] The methacrylic resin composition according to Claim 35, further comprising:

an ester compound having an α-hydrogen (component B2) represented by Formula (3-2),

[Chemical Formula 11]



· · · (3-2)

(in Formula (3-2), R^{35} and R^{36} are each independently a hydrogen atom or an alkyl group having 1 to 5 carbon atoms, and R^{37} is an alkyl group having 1 to 5 carbon

atoms),

wherein preferably R^{35} and R^{36} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{37} is a methyl group, an ethyl group, an n-propyl group, or an isopropyl group.

[Claim 41] The methacrylic resin composition according to Claim 40,

wherein, when a concentration of component B2 with respect to the total mass of the methacrylic resin composition is indicated by YB2 (ppm by mass), YB2 is 5 to 10000 ppm by mass.

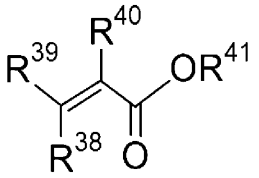
[Claim 42] The methacrylic resin composition according to Claims 40 or 41,

wherein, when a concentration of component B2 with respect to the total mass of the methacrylic resin composition is indicated by YB2 (ppm by mass), YB2/YA3 is 0.005 to 1000.

[Claim 43] The methacrylic resin composition according to Claim 35, further comprising:

an α,β-unsaturated carbonyl compound (component B3) represented by Formula (3-3),

[Chemical Formula 12]



$\cdots$(3-3)

(in Formula (3-3), R^{38}, R^{39}, and R^{40} are each independently a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, and R^{41} is an alkyl group having 1 to 10 carbon atoms),

wherein preferably R^{38}, R^{39}, and R^{40} are each independently a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, or an isopropyl group, and R^{41} is a

methyl group, an ethyl group, an n-propyl group, or an isopropyl group.

[Claim 44] The methacrylic resin composition according to Claim 43,

wherein, when a concentration of component B3 with respect to the total mass of the methacrylic resin composition is indicated by YB3 (ppm by mass), YB3 is 5 to 10000 ppm by mass.

[Claim 45] The methacrylic resin composition according to Claims 43 or 44,

wherein, when a concentration of component B3 with respect to the total mass of the methacrylic resin composition is indicated by YB3 (ppm by mass), YB3/YA3 is 0.005 to 1000.

[Claim 46] The methacrylic resin composition according to any one of Claims 28 to 45,

wherein the methacrylic polymer includes, with respect to a total mass of the methacrylic polymer, 70% to 100% by mass of a repeating unit derived from methyl methacrylate and 0% to 30% by mass of a repeating unit derived from an acrylic acid ester.

[Claim 47] The methacrylic resin composition according to any one of Claims 28 to 45,

wherein the methacrylic polymer includes, with respect to a total mass of the methacrylic polymer, 50% to 100% by mass of a repeating unit derived from methyl methacrylate and 0% to 50% by mass of a repeating unit derived from styrene.

[Claim 48] A molded resin object, comprising:

the methacrylic resin composition according to any one of Claims 28 to 47.