CLAIMS

[Claim 1] An antifouling coating composition comprising:

a silicon atom-containing resin; and

a thermoplastic resin other than the silicon atom-containing resin,

wherein

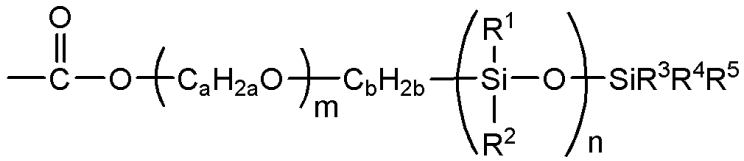
the silicon atom-containing resin includes a constituent unit (A) having at least one kind of silicon atom-containing group selected from the group consisting of a group represented by a formula (I) below, a group represented by a formula (II) below, a group represented by a formula (III) below, and a group represented by a formula (IV) below,

the thermoplastic resin includes a thermoplastic resin having a weight average molecular weight of greater than or equal to 1,000,

a content of the thermoplastic resin having a weight average molecular weight of greater than or equal to 1,000 is greater than or equal to 6.0 parts by mass and less than or equal to 11.0 parts by mass with respect to 100 parts by mass of the silicon atom-containing resin, and

the thermoplastic resin having a weight average molecular weight of greater than or equal to 1,000 is at least one kind selected from a group consisting of polyvinyl ether, a vinyl chloride-isobutyl vinyl ether copolymer and a (meth)acrylic resin:

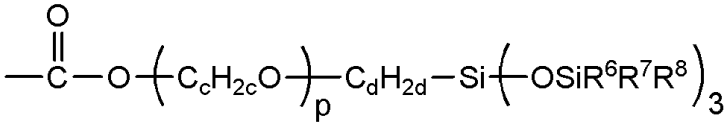
[Chem. 1]



(I)

[in the formula (I), a and b each independently represent an integer of 2 to 5, m represents an integer of 0 to 50, and n represents an integer of 3 to 270; and R^1 to R^5 each independently represent an alkyl group, an alkoxy group, a phenyl group, a substituted phenyl group, a phenoxy group, or a substituted phenoxy group];

[Chem. 2]

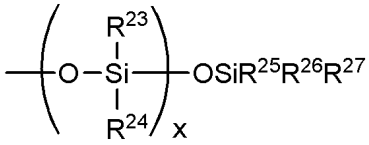


(II)

[in the formula (II), c and d each independently represent an integer of 2 to 5, and p represents an integer of 0 to 50; R^6, R^7 and R^8 each independently represent an alkyl group, R^a, or R^b;

R^a is

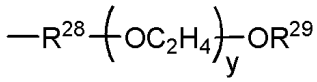
[Chem. 3]



(in the formula, x represents an integer of 0 to 200, and R^{23} to R^{27} are the same or different and each represent an alkyl group); and

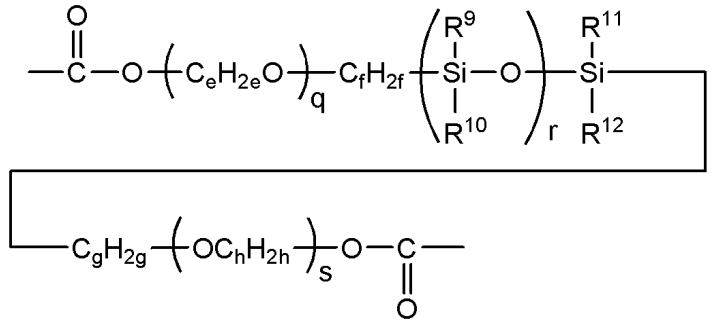
R^b is

[Chem. 4]



(in the formula, y represents an integer of 1 to 200, and R^{28} and R^{29} are the same or different and each represent an alkyl group)];

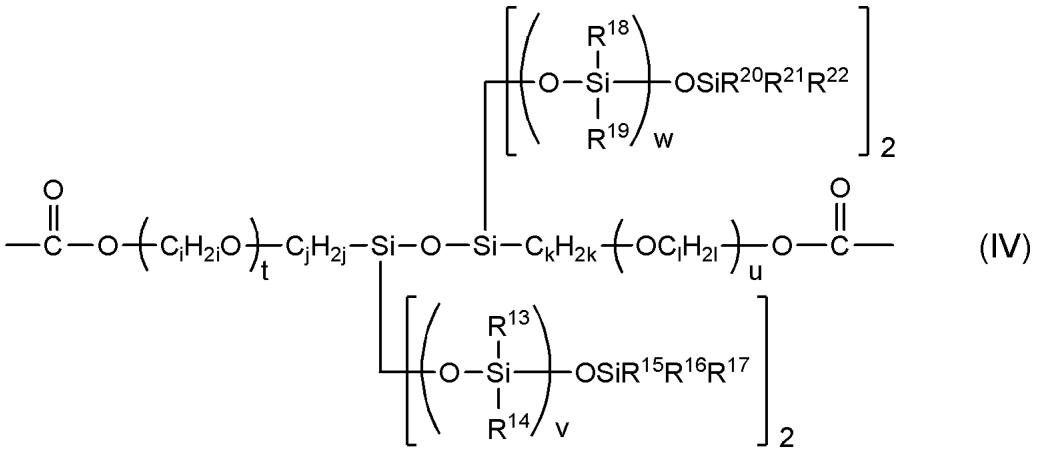
[Chem. 5]



(III)

[in the formula (III), e, f, g, and h each independently represent an integer of 2 to 5, q and s each independently represent an integer of 0 to 50, and r represents an integer of 3 to 270; and R^9 to R^{12} each independently represent an alkyl group, an alkoxy group, a phenyl group, a substituted phenyl group, a phenoxy group, or a substituted phenoxy group];

[Chem. 6]



(IV)

[in the formula (IV), i, j, k, and l each independently represent an integer of 2 to 5, t and u each independently represent an integer of 0 to 50, and v and w each independently represent an integer of 0 to 70; and R^{13} to R^{22} are the same or different and each represent an alkyl group].

[Claim 2] The antifouling coating composition according to claim 1, wherein the silicon atom-containing resin further includes a constituent unit (B) having a triorganosilyloxycarbonyl group.

[Claim 3] The antifouling coating composition according to claim 1 or 2, wherein the silicon atom-containing resin further includes a constituent unit (C) derived from a monomer (c) which is a monofunctional (meth)acrylic acid ester represented by a formula (c) below:

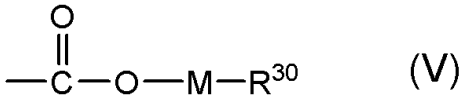
$CH_2=C(R^A)(COOR^B)$ (c)

[in the formula (c), R^A represents a hydrogen atom or a methyl group; and R^B represents a monovalent group including one or more kinds selected from the group consisting of a hydroxyl group, a carboxy group, and an oxyalkylene chain].

[Claim 4] The antifouling coating composition according to any one of claims 1 to 3, wherein the silicon atom-containing resin further includes a constituent unit (D) having at least one kind of metal atom-containing group selected from the group consisting of a group represented by a formula (V) below and a group represented by a

formula (VI) below:

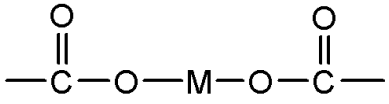
[Chem. 7]



(V)

[in the formula (V), M represents a divalent metal atom, and R^{30} represents an organic acid residue or an alcohol residue]; and

[Chem. 8]



(VI)

[in the formula (VI), M represents a divalent metal atom].

[Claim 5] The antifouling coating composition according to any one of claims 1 to 4, wherein a content of the constituent unit (A) is greater than or equal to 20 mass% in all constituent units contained in the silicon atom-containing resin.

[Claim 6] The antifouling coating composition according to any one of claims 1 to 5, not comprising an antifouling agent.

[Claim 7] The antifouling coating composition according to any one of claims 1 to 5, further comprising an antifouling agent.

[Claim 8] The antifouling coating composition according to claim 7, wherein the antifouling agent is at least one kind selected from the group consisting of cuprous oxide, pyrithione metal salt, 4,5-dichloro-2-n-octyl-4-isothiazolin-3-one, 2-methylthio-4-t-butylamino-6-cyclopropylamino-s-triazine, 4-bromo-2-(4-chlorophenyl)-5-(trifluoromethyl)-1H-pyrrole-3-carbonitrile, and medetomidine.

[Claim 9] An antifouling coating film formed from the antifouling coating composition according to any one of claims 1 to 8.

[Claim 10] A composite coating film comprising a primer coating film formed from an antirust coating composition, and an antifouling coating film formed from the antifouling coating composition according to any one of claims 1 to 8 and overlaid on the primer coating film.

[Claim 11] A ship comprising the antifouling coating film according to claim 9 or the composite coating film according to claim 10.

[Claim 12] An in-water structure comprising the antifouling coating film according to claim 9 or the composite coating film according to claim 10.