Claims

1. An antifouling coating composition comprising:

(i) a (meth)acrylic silyl ester copolymer comprising at least 15 wt% silyl ester monomers, relative to the total weight of monomers in the (meth)acrylic silyl ester copolymer and/or

(ii) a (meth)acrylic polymer comprising 10 wt% or less of silyl ester monomers and 5.0 wt% or less of metal ester monomers, relative to the total weight of monomers in the (meth)acrylic polymer;

(iii) a monocarboxylic acid or a metal salt thereof;

(iv) biocides comprising:

a. tralopyril; and

b. one or more copper compounds having a copper content of at least 40 wt%, relative to the formula weight of the copper compound wherein the coating composition as a whole comprises 10.0 wt% or less of biocides; and

(v) at least 35 wt% of pigments, extenders and biocides combined, relative to the total weight of the coating composition as a whole.

2. The antifouling coating composition as claimed in claim 1, wherein said composition comprises a (meth)acrylic silyl ester copolymer (i) or both a (meth)acrylic silyl ester copolymer (i) and a (meth)acrylic polymer (ii).

3. The antifouling coating composition as claimed in any preceding claim, wherein the composition comprises 8.0 wt% or less of biocides, relative to the total weight of the coating composition as a whole, preferably 5.0 wt% or less.

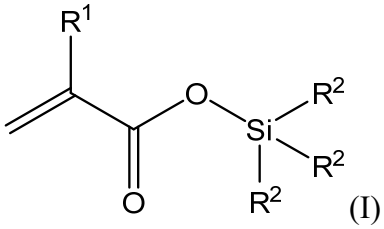
4. The antifouling coating composition as claimed in any preceding claim, wherein the copper compound has a copper content of at least 45 wt%, preferably at least 50 wt%, especially metallic copper or copper(I) oxide.

5. The antifouling coating composition as claimed in any preceding claim, wherein tralopyril is present in an amount of 0.1 to 5.0 wt%, relative to the total weight of the composition, preferably 0.2 to 3.0 wt%, more preferably 0.3 to 2.0 wt%, even more preferably 0.4 to 1.0 wt% and/or

wherein the one or more copper compounds is present in an amount of 0.1 to 8.0 wt%, relative to the total weight of the composition, preferably 0.2 to 5.0 wt%, more preferably 0.3 to 3.0 wt%, even more preferably 0.3 to 2.0 wt%, further preferred 0.3 to 1.0 wt%.

6. The antifouling coating composition as claimed in any preceding claim, wherein the (meth)acrylic silyl ester copolymer (i) comprises structural units derived from the following monomers:

(a) a silyl ester monomer of formula (I),

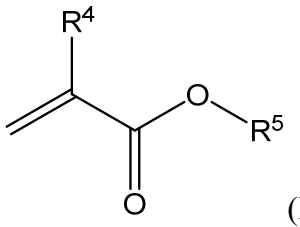


(I)

wherein R^1 is H or CH_3;

R^2 is each independently selected from C1-C10 hydrocarbyl groups preferably isopropyl;

(b) one or more monomer(s) of formula (II)



(II)

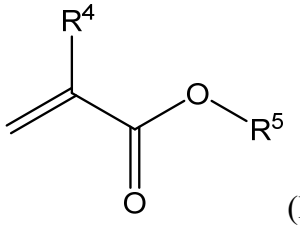
wherein R^4 is H or CH_3, and R^5 is a C1-C20 hydrocarbyl substituent, preferably a C1-10 alkyl substituent.

7. The antifouling coating composition as claimed in any preceding claim wherein the coating composition comprises a (meth)acrylic polymer (ii).

8. The antifouling coating composition as claimed in any preceding claim wherein the (meth)acrylic polymer (ii) is a (meth)acrylic polymer (ii-a) that has a Tg of less than 10 °C, further preferred less than 0 °C, such as less than -10 °C; and wherein the (meth)acrylic copolymer (ii-a) preferably comprises

(a) (meth)acrylic acid and

(b) one or more monomer(s) of formula (II)

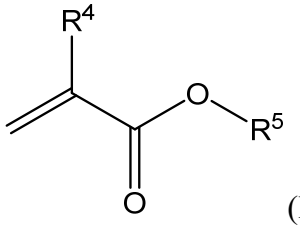


(II)

wherein R^4 is H or CH_3, and R^5 is a C1-C20 hydrocarbyl substituent preferably a C1-10 alkyl substituent, most preferably methyl, ethyl, n-propyl, n-butyl or 2-ethylhexyl.

9. The antifouling coating composition as claimed in any preceding claim, wherein the (meth)acrylic polymer (ii) is a (meth)acrylic polymer (ii-b) and has a glass transition temperature (Tg) of at least 10 °C, preferably wherein the (meth)acrylic ester polymer (ii-b) comprises:

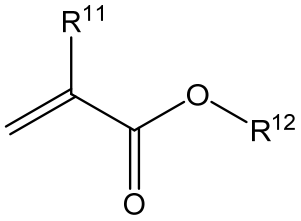
(a) one or more monomer(s) of formula (II)



(II)

wherein R^4 is H or CH_3, and R^5 is a C1-C20 hydrocarbyl substituent preferably a C1-10 alkyl substituent, most preferably methyl, ethyl, n-propyl, n-butyl or 2-ethylhexyl; and

(b) one or more monomers of formula (VI)



(VI)

wherein R^{11} is H or CH_3, and R^{12} is a C3-40 substituent, such as C3-C20 substituent, containing at least one oxygen or nitrogen atom, preferably at least one oxygen atom or R^{12} represents a poly(alkylene glycol) group.

10. The antifouling coating composition as claimed in any preceding claim, wherein component (i) is present in an amount of 2.0 to 30 wt%, relative to the total weight of the coating compositions as a whole, preferably 5.0 to 25 wt%; and/or wherein component (ii-a) is present in an amount of 0.5 to 12 wt%, relative to the total weight of the coating compositions as a whole, preferably 1.0 to 7.0 wt%; and/or component (ii-b) is present in an amount of 1.0 to 15 wt.% relative to the total coating composition as a whole, preferably 2.0 to 12 wt%; and
wherein the monocarboxylic acid or metal salt thereof (iii) is present in an amount of 5.0 to 30 wt% based on the total weight of the coating composition as a whole, preferably 5.0 to 25 wt%.

11. The antifouling coating composition as claimed in any preceding claim, wherein the monocarboxylic acid or metal salt thereof (iii) is rosin, modified rosin or metal salts thereof, especially gum rosin, hydrogenated gum rosin, copper salt of gum rosin, zinc salt of gum rosin, copper salt of hydrogenated gum rosin, zinc salt of hydrogenated gum rosin and mixtures thereof.

12. The antifouling coating composition as claimed in any preceding claim, further comprising one or more biocides selected from zinc pyrithione, copper pyrithione, zineb and 4,5-dichloro-2-octyl-4-isothiazolin-3-one.

13. The antifouling coating composition as claimed in any preceding claim, wherein tralopyril is present in an amount of 5.0 to 60.0 wt%, relative to the total weight of biocides (iv), preferably 7.0 to 60.0 wt%, more preferably 8.0 to 60.0 wt%, even more preferably 9.0 to 60.0 wt%, further preferred 10.0 to 60.0 wt% and/or wherein the one or more copper compounds is present in an amount of 5.0 to 90.0 wt%, relative to the total weight of biocides (iv), preferably 6.0 to 87.0 wt%, more preferably 7.0 to 85.0 wt%, even more preferably 8.0 to 82.0 wt%, further preferred 9.0 to 80.0 wt%.

14. A process for protecting an object from fouling, said process comprising coating at least a part of said object which is subject to fouling with an antifouling coating composition as claimed in any of claims 1 to 13.

15. An object coated with the antifouling coating composition as claimed in any of claims 1 to 13.