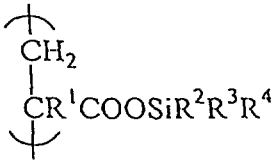
SILYL (METH) ACRYLATE COPOLYMERS, PROCESSES FOR PREPARING THE SAME, ANTIFOULING PAINT COMPOSITIONS CONTAINING THE SILYL (METH) ACRYLATE COPOLYMERS, ANTIFOULING COATING FILMS FORMED FROM THE ANTIFOULING PAINT COMPOSITIONS, ANTIFOULING METHODS USING THE ANTIFOULING PAINT COMPOSITIONS, AND HULLS OR UNDERWATER STRUCTURES COATED WITH THE ANTIFOULING COATING FILMS

ABSTRACT

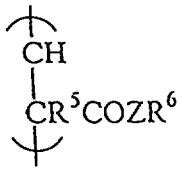
Disclosed is a silyl (meth)acrylate copolymer which comprises 20 to 80 % by weight of (a) silyl (meth)acrylate constituent units represented by the following formula (I), 0.01 to 40 % by weight of (b) acrylic unsaturated monomer constituent units represented by the following formula (II) and 5 to 79.99 % by weight of (c) unsaturated monomer constituent units other than the constituent units (a) and (b), with the proviso that the total amount of the constituent units (a), (b) and (c) is 100 % by weight, and which has a weight-average molecular weight, as measured by GPC, of not more than 200,000.



...(I)

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wherein R^1 is a hydrogen atom or a methyl group, and R^2, R^3 and R^4 may be the same or different and are each an alkyl group, a cycloalkyl group or a phenyl group which may have a substituent group.



...(II)

wherein R^5 is a hydrogen atom or a methyl group, Z is an oxygen atom or $-NR^7$, when Z is an oxygen atom, R^6 is a hydroxyalkyl or hydroxycycloalkyl group which may have a substituent group or a polyalkylene glycol group represented by the formula $-(R^8O)_nH$ (wherein R^8 is an alkylene group and n is an integer of 2 to 50), and when Z is $-NR^7$, R^7 is an alkyl group which may be substituted with any of a halogen, a hydroxyl group, an amino group, a substituted amino group, an acyl group and an alkoxy group, and R^6 is a hydrogen atom.

Also disclosed are a process for preparing the silyl (meth)acrylate copolymer, an antifouling paint composition comprising the copolymer, a coating film formed from the paint composition, a hull with the coating film, and an antifouling method using the paint composition. By the use of the silyl (meth)acrylate copolymer, there can be produced an antifouling paint

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capable of forming an antifouling coating film which hardly suffers from occurrence of cracks, has excellent adhesive strength and thereby hardly suffers from peeling, can be favorably controlled in the hydrolysis rate, and is excellent in antifouling performance (antifouling activities) and long-term antifouling properties.

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