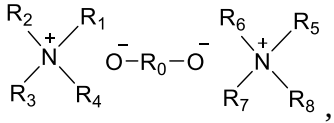
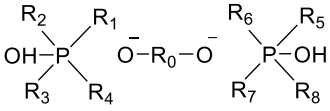
CLAIMS

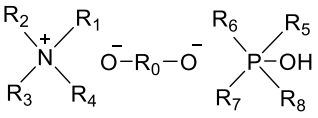
1. An amphiphilic siloxane gel, wherein the gel comprises an active species, and the active species is one of or a mixture of more of organic bases having quaternary ammonium salt groups or alkylphosphonium hydroxide groups, wherein the organic base has one of the following structural formulae:



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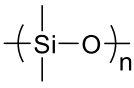


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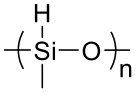


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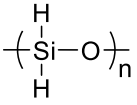
wherein R_0 is one of



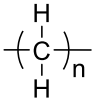
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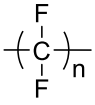
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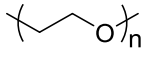
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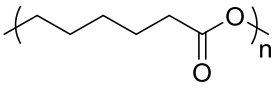
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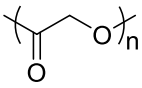
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and



;

R_1 is C_aH_{2a+1}, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 have identical structures or a combination of different structures, which are selected from C_bH_{2b+1} and phenyl, $0<n<100$, $0<a<8$, and $0<b<20$, and wherein the amphiphilic siloxane gel comprises the following mass parts of raw materials:

2.5-15 parts of active species,

85-97.5 parts of cyclic siloxane, and

40-150 parts of lubricating fluid.

2. The amphiphilic siloxane gel of claim 1, wherein the cyclic siloxane is one of or a combination of more of hexamethylcyclotrisiloxane, octamethylcyclotetrasiloxane, cyclotetrapolydimethylsiloxane, tetramethyltetravinylcyclotetrasiloxane, 2,4,6,8-tetramethyl-2,4,6,8-tetrakis(3,3,3-trifluoropropyl)cyclotetrasiloxane, octaphenylcyclotetrasiloxane, heptamethylphenylcyclotetrasiloxane, 1,3,5,7-tetrakis(diphenylphosphinoethyl) tetramethylcyclotetrasiloxane, tetramethyltetraphenylcyclotetrasiloxane, methacryltrisepoxycyclosiloxane , tetrakisepoxy cyclosiloxane, 1,3,5,7-tetramethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, and tetradecamethylcycloheptasiloxane.

3. The amphiphilic siloxane gel of claim 1 or 2, wherein the lubricating fluid is one of or a

combination of more of silicone oil derivative, fluorinated polyether oil and mineral oil, the silicone oil derivative comprises dimethyl silicone oil, phenyl silicone oil and the like, and the viscosity of the lubricating fluid is 10-1000 cst.

4. A method for preparing the amphiphilic siloxane gel of any one of claims 1-3, comprising the following steps:

S1: mixing an active species and a cyclic siloxane, and then carrying out a ring-opening polymerization to obtain a gel substrate;

S2: immersing the gel substrate in a lubricating fluid to obtain an amphiphilic siloxane gel.

5. The method for preparing the amphiphilic siloxane gel of claim 4, wherein in S1, the mixing is stirring and mixing well at 60-100°C at a stirring rate of 200-1000 r/min, and the ring-opening polymerization is reacting under nitrogen or an inert gas condition at 40-200°C for 3-40h, and then reducing the temperature to room temperature.

6. The method for preparing the amphiphilic siloxane gel of claim 4 or 5, wherein, in S2, the immersing is carried out at a temperature ranging from 25 °C to 50 °C for a time period ranging from 6h to 36h.

7. Use of the amphiphilic siloxane gel of any one of claims 1-3, wherein the amphiphilic siloxane gel is used for preparing an anti-fouling coating.