

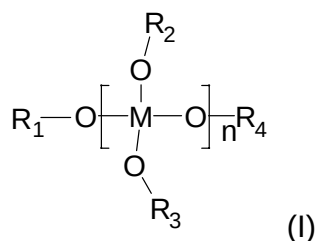
$$\begin{array}{c} \text{R}_6 \\ | \\ \text{---Si---R}_7 \\ | \\ \text{R}_5 \end{array} \quad (\text{IV}), \quad \begin{array}{c} \text{R}_6 \\ | \\ \text{---[Si---O---R}_8\text{]}_p \\ | \\ \text{R}_5 \end{array} \quad \begin{array}{c} \text{R}_6 \\ | \\ \text{---[Si---O]}_p\text{---R}_8' \\ | \\ \text{R}_5 \end{array} \quad (\text{V})$$

In one embodiment the soluble, multi-ligand-substituted metal compound of structure(I) is where M is titanium, and n is 4 to 16, the organic moiety i) is chosen from the group consisting of

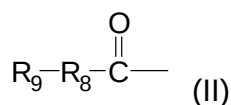


We claim:

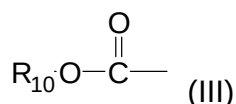
1. A soluble, multi-ligand-substituted metal compound of structure(I):



wherein M is a metal and n is 1 to 20, and wherein at least one of R₁, R₂, R₃, and R₄ is i) and at least one of R₁, R₂, R₃, and R₄ is ii), where i) is a silicon bearing organic moiety having at least 2 carbons, and ii) is an organic moiety (II),



wherein R₈ is selected from a group consisting of C₂-C₁₀ alkylene, C₃-C₁₂ branched alkylene, C₅-C₁₂ cycloalkylene, C₂-C₁₀ alkylene containing a C=C double bond, C₃-C₁₂ branched alkylene containing a C=C double bond, and a C₅-C₁₂ cycloalkylene containing a C=C double bond, and R₉ is hydrogen or the alkyloxycarbonyl moiety (III), where R₁₀ is a C₁-C₈ alkyl group,



provided that the silicon bearing moiety bearing an organic moiety having at least 2 carbons i) ranges from about 10 mole % to about 80 mole%, and ii) ranges from about 20 mole % to about 90 mole % of the total groups R₁, R₂, R₃, and R₄.

2. The compound of claim 1, wherein the silicon bearing moiety bearing an organic moiety having at least 2 carbons i) ranges from 30 mole % to 60 mole%, and that the organic moiety ii) ranges from 30 mole % to 60 mole % of the total of groups R₁, R₂, R₃, and R₄.

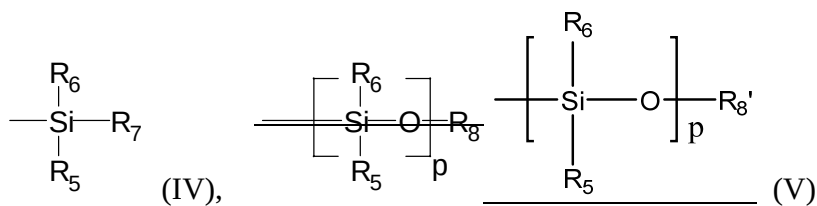
3. The compound of claim 1-~~or 2~~, wherein in structure(I) at least one of R₁, R₂, R₃, and R₄ further comprises C₁-C₈ alkyl moiety ranging up to 50 mole %, ~~preferably up to 35 mole %~~ of the total of groups R₁, R₂, R₃, and R₄.

4. The compound of claim 1, wherein structure(I) at least one of R₁, R₂, R₃, and R₄ further comprises C₁-C₈ alkyl moiety ranging up to 50 mole of the total of groups R₁, R₂, R₃, and R₄

~~45.~~ The compound ~~of one of claims 1 to 3~~, wherein the metal is selected from a group consisting of titanium, zirconium, tantalum, lead, antimony, thallium, indium, ytterbium, gallium, hafnium, aluminum, magnesium, molybdenum, germanium, tin, iron, cobalt, nickel, copper, zinc, gold, silver, cadmium, tungsten, and platinum.

6. The compound of claim 1, ~~and/or~~ wherein the metal is more than one metal when n is 2 to 20.

~~57.~~ The compound ~~of one of claims 1 to 4~~, wherein the silicon bearing organic moiety having at least 2 carbon i) is selected from a group consisting of a trisubstitutedsilyl moiety(IV) and a siloxane moiety(V)



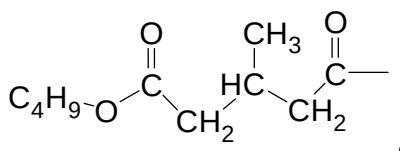
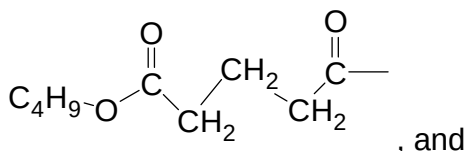
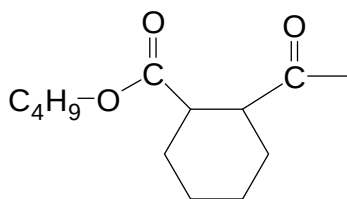
wherein R_5 , and R_6 , are independently selected from a group consisting of C_1 - C_8 alkyl, C_3 - C_{12} branched alkyl, and aryl, R_7 is independently selected from a group consisting of C_1 - C_8 alkyl, aryl and hydroxyl, and R_8 is selected from group consisting of hydrogen, a C_1 - C_8 alkyl, a C_1 - C_8 alkyl substituted with a hydroxyl

group, a carboxylic acid group (CO₂H), and an aryl, and further where p represents the number of repeat units in the siloxane moiety (v).

~~68.~~ The compound of ~~one of~~ claims 1 to 5, where the silicon bearing organic moiety having at least 2 carbon i) is a trisubstituted silyl moiety (IV).

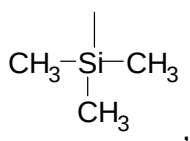
9. The compound of claim 1, where the silicon bearing organic moiety having at least 2 carbon i) ~~or~~ is a siloxane moiety (V).

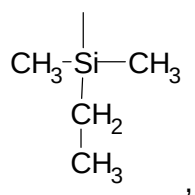
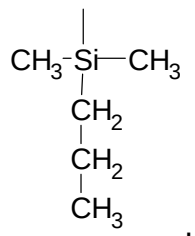
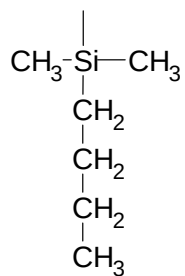
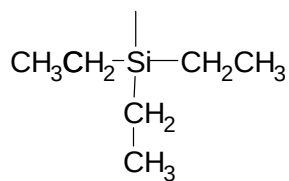
~~710.~~ The compound of ~~one of~~ claims 1 to 6, where M is Ti, and the organic moiety i) is selected from the group consisting of



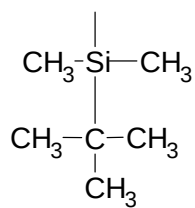
and further wherein n = 4-16, ~~or~~

11. The compound of claim 1 where M is Ti and the silicon bearing organic moiety at least 2 carbon ii) is selected from the group consisting of





and



and further wherein n=4-16.

812. A composition comprising:

a. a soluble, multi-ligand-substituted metal compound of the following structure(I)

~~913.~~ The composition of claim ~~8~~12 where the composition further comprises a surfactant.

~~104.~~ The composition of claim ~~8~~ or ~~9~~12, further comprising at least one selected from a group consisting of a thermal acid generator, a thermal base generator, and a thermally activated peroxide.

~~115.~~ The composition of ~~one of claims 8 to 10~~ 12, wherein n is 2 to 20, preferably n is 1.

16. The composition of claim 12, wherein n is 1.

~~127.~~ The composition of ~~one of claims 8 to 11~~ 12, further comprising a crosslinking additive.

~~138.~~ A method of manufacturing an electronic device on a substrate comprised of a patterned photoresist comprising:

a. applying a composition from ~~one of claims 8 to 12~~ onto substrate; and,

b. baking the film.

~~14.~~ ~~The method according to claim 13 where the substrate is a patterned photoresist comprising, vias, trenches, holes or other hollow topographical features wherein after baking the film the method further comprises the steps of:~~

c. removing the composition overlaying the top of the patterned photoresist; and,

d. removing the resist with oxygen plasma, thereby forming a negative tone image of the original patterned resist.

| 159. The method of claim ~~13 or 14~~18, further comprising removing the residual composition with a stripper composition.