CLAIMS

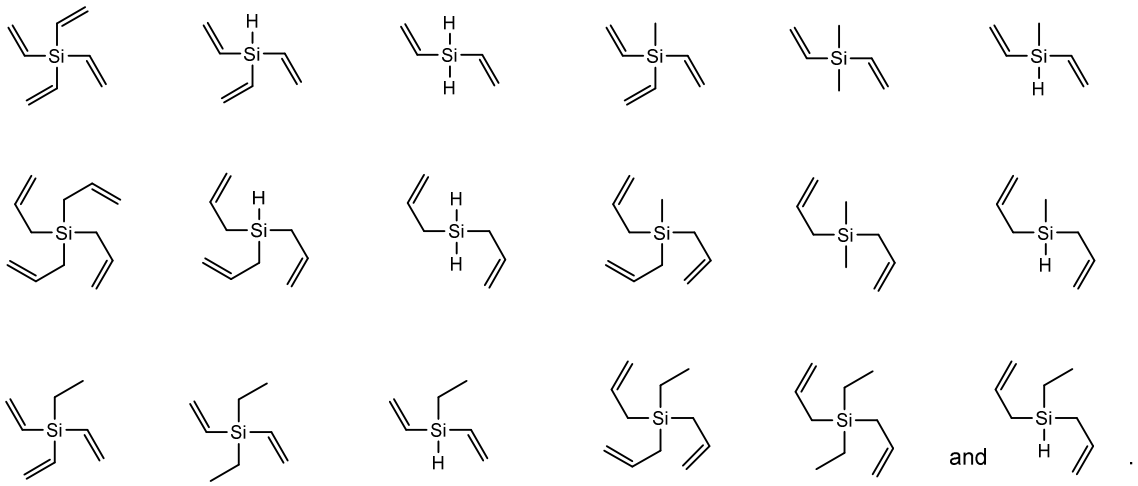
1. A method for producing an alkenyl or alkynyl-containing organosilicon precursor composition, the method comprising the steps of:

distilling at least once a composition comprising at least one alkenyl or alkynyl-containing organosilicon compound having a formula $R_nSiR^1_{4-n}$ wherein R is selected from the group consisting of a linear or branched C_2 to C_6 alkenyl group, and a linear or branched C_2 to C_6 alkynyl group; R^1 is selected from the group consisting of hydrogen, a linear or branched C_1 to C_{10} alkyl group, and a C_3 to C_{10} aryl group; and n is 1 to 4, wherein a distilled alkenyl or alkynyl-containing organosilicon precursor composition is produced after distilling; and

packaging the distilled alkenyl or alkynyl-containing organosilicon precursor composition in a container, wherein the container permits transmission into the container of no more than 10% of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm, wherein the distilled alkenyl or alkynyl-containing organosilicon precursor composition includes no more than 100 ppm (0.01 wt. %) of >1000 amu impurities as determined by Gel Permeation Chromatography (GPC).

2. The method of claim 1 wherein the at least one alkenyl or alkynyl-containing organosilicon compound is one or more selected from the group consisting of

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3. The method of claim 2 wherein the at least one alkenyl or alkynyl-containing organosilicon compound comprises tetravinylsilane.

4. The method of claim 1 further comprising adding a stabilizer compound to the distilled alkenyl or alkynyl-containing organosilicon precursor composition prior to said packing step.

5. The method of claim 4 wherein the stabilizer compound is selected from the group consisting of 2,6-di-tert-butyl-4-methyl phenol , 2,2,6,6-tetramethyl-1-piperidinyloxy (TEMPO), 2- tert-butyl-4-hydroxyanisole, 3-tert-butyl-4-hydroxyanisole, propyl ester 3,4,5-trihydroxy-benzoic acid, 2-(1,1-dimethylethyl)-1,4-benzenediol, diphenylpicrylhydrazyl, 4-tert-butylcatechol, N-methylaniline, p- methoxydiphenylamine, diphenylamine, N,N'-diphenyl-p-phenylenediamine, p- hydroxydiphenylamine, phenol, octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate, tetrakis (methylene (3,5-di-tert-butyl)-4- hydroxy-hydrocinnamate) methane, phenothiazines, alkylamidonoisoureas, thiodiethylene bis (3,5,-di-tert-butyl-4-hydroxy-hydrocinnamate, 1,2,-bis (3,5-di-tert-butyl-4-hydroxyhydrocinnamoyl) hydrazine, tris (2-methyl-4- hydroxy-5-tert-butylphenyl) butane, cyclic neopentanetetrayl bis (octadecyl phosphite), 4,4'-thiobis (6-tert-butyl-m-cresol), 2,2'- methylenebis (6-tert-butyl-p-

cresol), oxalyl bis (benzylidenehydrazide), raw seed oils, wheat germ oil, tocopherols and gums.

~~6. The method of claim 1 wherein the distilled alkenyl or alkynyl-containing organosilicon precursor composition includes less than 100 ppm (0.01 wt. %) of >1000 amu impurities as determined by Gel Permeation Chromatography (GPC).~~

~~7.~~6. The method of claim 1 wherein the container permits transmission into the container of no more than 7% of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm.

~~8.~~7. The method of claim ~~7~~ 6 wherein the container permits transmission into the container of no more than 1% of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm.

~~9.~~8. The method of claim ~~8~~ 7 wherein the container permits 0% transmission into the container of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm.

~~10.~~9. The method of claim 1, wherein the distilled alkenyl or alkynyl-containing organosilicon precursor composition includes less than 50 ppm water impurity.

~~11.~~10. The method of claim 1, wherein the distilled alkenyl or alkynyl-containing organosilicon precursor composition includes less than 10 ppm halide impurity.

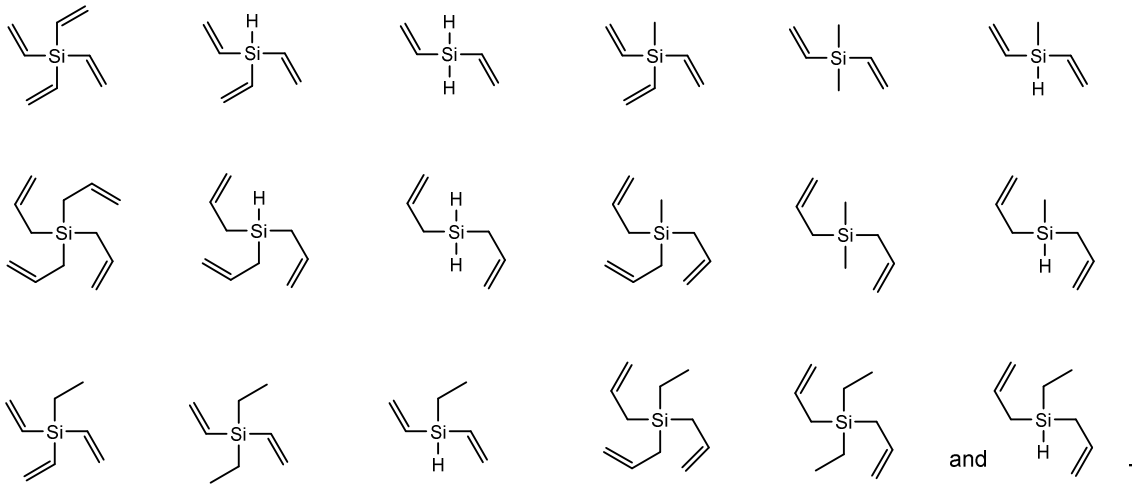
~~12.~~11. A system for storing an alkenyl or alkynyl-containing organosilicon compound, the system comprising:

a container, wherein the container permits transmission into the container of no more than 10% of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm; and

contained within the container, at least one distilled alkenyl or alkynyl-containing organosilicon compound having a formula $R_nSiR^1_{4-n}$ wherein R is selected from the group consisting of a linear or branched C_2 to C_6 alkenyl group, and a linear or branched C_2 to C_6 alkynyl group; R^1 is selected from the group consisting of hydrogen, a linear or branched C_1 to C_{10} alkyl group, a C_3 to C_{10} cyclic alkyl group, and a C_3 to C_{10} aryl group; and n is 1 to 4.

wherein the distilled alkenyl or alkynyl-containing organosilicon precursor composition includes no more than 100 ppm (0.01 wt. %) of >1000 amu impurities as determined by Gel Permeation Chromatography (GPC).

~~13.~~12. The system of claim ~~12~~ 11 wherein the at least one distilled alkenyl or alkynyl-containing organosilicon compound is selected from the group consisting of



~~14.~~13. The system of claim ~~13~~ 12 wherein the at least one distilled alkenyl or alkynyl-containing organosilicon compound comprises tetravinylsilane.

~~15.~~14. The system of claim ~~12~~ 11 wherein a stabilizer compound is further contained within the container.

~~16.~~15. The system of claim 15 wherein the stabilizer compound is selected from the group consisting of 2,6-di-tert-butyl-4-methyl phenol (BHT), 2,2,6,6-tetramethyl-1-piperidinyloxy (TEMPO), 2- tert-butyl-4-hydroxyanisole, 3-tert-butyl-4-hydroxyanisole, propyl ester 3,4,5-trihydroxy-benzoic acid, 2-(1,1-dimethylethyl)-1,4-benzenediol, diphenylpicrylhydrazyl, 4-tert-butylcatechol, N-methylaniline, p-methoxydiphenylamine, diphenylamine, N,N'-diphenyl-p-phenylenediamine, p- hydroxydiphenylamine, phenol, octadecyl-3-(3,5-di-tert-butyl-4- hydroxyphenyl) propionate, tetrakis (methylene (3,5-di-tert-butyl)-4- hydroxy-hydrocinnamate) methane, phenothiazines, alkylamidonoisoureas, thiodiethylene bis (3,5,-di-tert-butyl-4-hydroxy-hydrocinnamate, 1,2,-bis (3,5-di-tert-butyl-4-hydroxyhydrocinnamoyl) hydrazine, tris (2-methyl-4- hydroxy-5-tert-butylphenyl) butane, cyclic neopentanetetrayl bis (octadecyl phosphite), 4,4'-thiobis (6-tert-butyl-m-cresol), 2,2'-methylenebis (6-tert-butyl-p-cresol), oxalyl bis (benzylidenehydrazide), raw seed oils, wheat germ oil, tocopherols and gums.

~~17.~~16. The system of claim ~~12~~ 11 wherein the at least one distilled alkenyl or alkynyl-containing organosilicon compound has than 100 ppm (0.01 wt. %) of >1000 amu impurities as determined by Gel Permeation Chromatography (GPC).

~~18.~~17. The system of claim ~~12~~ 11 wherein the container permits transmission into the container of no more than 7% of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm.

~~19.~~18. The system of claim ~~18~~ 17 wherein the container permits transmission into the container of no more than 5% of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm.

~~20.~~19. The system of claim ~~19~~ 18 wherein the container permits transmission into the container of no more than 2% of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm.

~~21.~~20. The system of claim ~~20~~ 19 wherein the container permits transmission into the container of no more than 1% of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm.

~~22.~~21. The system of claim ~~21~~ 20 wherein the container permits 0% transmission into the container of ultraviolet and visible light having a wavelength of between 290 nm to 450 nm.

~~23.~~22. The system of claim ~~12~~11, wherein less than 50 ppm water impurity is contained within the container.

~~24.~~23. The system of claim ~~12~~11, wherein less than 10 ppm halide impurity is contained within the container.