CLAIMS

What is claimed is:

1. A liquid titanium oxide composition comprising:

a solvent system;

an organotitanate; and

a high boiling point solvent having a boiling point in a range of about 140°C to about 400°C.

2. The liquid titanium oxide composition of claim 1, wherein an onset insolubility temperature of the liquid titanium oxide composition, when spin coated onto a silicon substrate and subjected to PGMEA, is higher than an onset insolubility temperature of the same liquid titanium oxide composition without the high boiling point solvent when spin coated onto a comparable silicon substrate and subjected to PGMEA.

3. The liquid titanium oxide composition of claim 1, wherein the organotitanate comprises a titanium alkoxide.

4. The liquid titanium oxide composition of claim 1, wherein the organotitanate comprises a titanium-oxygen backbone polymer.

5. The liquid titanium oxide composition of claim 1, wherein the solvent system comprises an alcohol.

6. The liquid titanium oxide composition of claim 1, wherein the solvent system comprises water.

7. The liquid titanium oxide composition of claim 1, wherein the liquid titanium oxide composition comprises substantially no water.

8. The liquid titanium oxide composition of claim 1, wherein the liquid titanium oxide composition comprises substantially no acid.

9. The liquid titanium oxide composition of claim 1, wherein the organotitanate has a formula $Ti(OR)_4$, where each R is not necessarily the same and R is an alkyl radical having 1 to 6 carbons or R is an alkylene oxide.

10. The liquid titanium oxide composition of claim 9, wherein the organotitanate comprises tetraisopropyl titanate (TIPO), tetraethyl titanate, tetrapropyl titanate, tetrabutyl titanate, tetraisobutyl titranate, tetra-tert-butyl titanate, tetrahexyl titanate, titanium (polyethylene oxide) triisopropoxide, titanium diisopropoxide (bis-2,4-pentanedionate), or mixtures thereof.

11. The liquid titanium oxide composition of claim 1, further comprising a composition stabilizer.

12. The liquid titanium oxide composition of claim 11, wherein the composition stabilizer comprises 2,4-pentanedione, 3,3-dimethyl-2,4-pentanedione, 3-methy-2,4-pentanedione ethylacetoacetate, diethyl malonate, diethyl malate, ethylene diamine tetra-acetic acid, oxalic acid, oxamic acid, octanoic acid, oleic acid, dodecylcarboxylic acid, perfluorooctanoic acid, ethyl lactate, butylated hydroxytoluene, 1, 3-propane diol, methyl pyruvate, or mixtures thereof.

13. The liquid titanium oxide composition of claim 1, wherein the high boiling point solvent comprises tripropylene glycol methyl ether, dipropylene glycol n-propyl ether, dipropylene glycol butyl ether, tripropylene glycol n-butyl ether, carbitol, hexyl carbitol, methoxytriglycol, methyl carbitol, butyl cellosolve, butyl cellosolve acetate, butyl carbitol acetate, diethylene glycol phenyl ether, or mixtures thereof.

14. The liquid titanium oxide composition of claim 1, wherein the liquid titanium oxide composition has a viscosity no greater than about 5cP.

15. A method for forming a liquid titanium oxide composition, the method comprising the steps of:

adding an organotitanate to a solvent system to form a mixture, wherein the organotitanate has a formula: $Ti(OR)_4$, where each R can be different and R is an alkyl radical having 1 to 6 carbons or R is an alkylene oxide;

adding a high boiling point solvent to the mixture, the high boiling point solvent having a boiling point in a range of from about 140°C to about 400°C; and

mixing the high boiling point solvent and the mixture.

CLAIMS

What is claimed is:

1. A liquid titanium containing composition comprising:

a solvent system;

an organotitanate; and

a high boiling point solvent having a boiling point in a range of about 140°C to about 400°C.

2. The liquid titanium containing composition of claim 1, wherein an onset insolubility temperature of the liquid titanium containing composition, when spin coated onto a silicon substrate and subjected to PGMEA, is higher than an onset insolubility temperature of the same liquid titanium containing composition without the high boiling point solvent when spin coated onto a comparable silicon substrate and subjected to PGMEA.

3. The liquid titanium containing composition of claim I, wherein the organotitanate comprises a titanium containing.

4. The liquid titanium containing composition of claim 1, wherein the organotitanate comprises a titanium-oxygen backbone polymer.

5. The liquid titanium containing composition of claim 1, wherein the solvent system comprises an alcohol.

6. The liquid titanium containing composition of claim 1, wherein the solvent system comprises water.

7. The liquid titanium containing composition of claim 1, wherein the liquid titanium containing composition comprises substantially no water.

8. The liquid titanium containing composition of claim 1, wherein the liquid titanium containing composition comprises substantially no acid.

9. The liquid titanium containing composition of claim 1, wherein the organotitanate has a formula Ti(OR)4, where each R is not necessarily the same and R is an alkyl radical having 1 to 6 carbons or R is an alkylene oxide.

10. The liquid titanium containing composition of claim 9, wherein the organotitanate comprises tetraisopropyl titanate (TIPO), tetraethyl titanate, tetrapropyl titanate, tetrabutyl titanate, tetraisobutyl titranate, tetra-tert-butyl titanate, tetrahexyl titanate, titanium (polyethylene oxide) triisopropoxide, titanium diisopropoxide (bis-2,4-pentanedionate), or mixtures thereof.

11. The liquid titanium containing composition of claim 1, further comprising a composition stabilizer.

12. The liquid titanium containing composition of claim 11, wherein the composition stabilizer comprises 2,4-pentanedione, 3,3-dimethyl-2,4-pentanedione, 3-methy-2,4-pentanedione ethylacetoacetate, diethyl malonate, diethyl malate, ethylene diamine tetraacetic acid, oxalic acid, oxamic acid, octanoic acid, oleic acid, dodecylcarboxylic acid, perfluorooctanoic acid, ethyl lactate, butylated hydroxytoluene, 1, 3-propane diol, methyl pyruvate, or mixtures thereof

13. The liquid titanium containing composition of claim 1, wherein the high boiling point solvent comprises tripropylene glycol methyl ether, dipropylene glycol n-propyl ether, dipropylene glycol butyl ether, tripropylene glycol n-butyl ether, carbitol, hexyl carbitol, methoxytriglycol, methyl carbitol, butyl cellosolve, butyl cellosolve acetate, butyl carbitol acetate, diethylene glycol phenyl ether, or mixtures thereof

14. The liquid titanium containing composition of claim 1, wherein the liquid titanium containing composition has a viscosity no greater than about 5cP.

15. A method for forming a liquid titanium containing composition, the method comprising the steps of:

adding an organotitanate to a solvent system to form a mixture, wherein the organotitanate has a formula: Ti(OR)4, where each R can be different and R is an alkyl radical having 1 to 6 carbons or R is an alkylene oxide;

adding a high boiling point solvent to the mixture, the high boiling point solvent having a boiling point in a range of from about 140°C to about 400°C; and

mixing the high boiling point solvent and the mixture.