CLAIMS

1. A composition for preparing a substrate for coating with a coating layer, the composition consisting essentially of:

(i) one or more organosilane(s) represented by general formula (I):

$$(Y–R)_nSiX_m$$

wherein

each of Y is independently a chemical moiety that is capable of chemically coupling to a functional group of the coating layer;

each of R is independently a C_{3-18} alkyl group;

each of X is independently a C_{1-6} alkoxy group;

n is 1, 2 or 3;

m is 1, 2 or 3; and wherein

n + m = 4;

(ii) a catalytic agent comprising a base selected from the group consisting of methanolamine, ethanolamine, diethanolamine, triethanolamine, propanolamine, butanolamine, trimethylamine, triethylamine, tripropylamine, tributylamine, ammonium hydroxide, tetramethylammonium hydroxide, tetraethylammonium hydroxide, tetrapropylammonium hydroxide, and tetrabutylammonium hydroxide and combinations thereof; and

(iii) an organic solvent.

2. The composition according to claim 1, wherein an amount of organosilane present is in a range of 0.1 wt% to 22.5 wt%.

3. The composition according to any one of claims 1-2, wherein an amount of catalytic agent present is in a range of 0.1 wt% to 2.7 wt%.

4. The composition according to any one of claims 1-3, wherein an amount of organic solvent present is in a range of 0.1 wt% to 97.4 wt%.

5. The composition according to any one of claims 1-4, wherein each of Y is a chemical moiety independently selected from the group consisting of amine, halogen, vinyl, acryloyloxy, glycidyloxy, hydrogen and aryl.

6. The composition according to any one of claims 1-5, wherein the organosilane comprises an aminoalkyl alkoxysilane compound selected from the group consisting of aminopropyltrimethoxysilane, aminobutyltrimethoxysilane, aminopentyltrimethoxysilane, aminohexyltrimethoxysilane, aminopropyltriethoxysilane, aminopropyltripropoxysilane, aminopropyltributoxysilane, aminopropyltripentoxysilane, aminopropyltrihexoxysilane, aminobutyltriethoxysilane, aminobutyltripropoxysilane, aminobutyltributoxysilane, aminobutyltripentoxysilane, aminobutyltrihexoxysilane, aminopentyltriethoxysilane, aminopentyltripropoxysilane, aminopentyltributoxysilane, aminopentyltripentoxysilane aminopentyltrihexoxysilane, aminohexyltriethoxysilane, aminohexyltripropoxysilane, aminohexyltributoxysilane, aminohexyltripentoxysilane, aminohexyltrihexoxysilane and combinations thereof.

7. The composition according to any one of claims 1-6, wherein the organic solvent is selected from the group consisting of acetone, ethyl acetate, ethyl alcohol, benzene, toluene, xylene, styrene and combinations thereof.

8. A method of coating a substrate, the method comprising:

applying a layer of the composition of any one of claims 1 to 7 to a surface of the substrate.

9. The method according to claim 8, further comprising, prior to applying the layer of the composition, subjecting the substrate to plasma treatment to activate the surface of the substrate.

10. The method according to claim 9, wherein the plasma treatment is atmospheric plasma treatment.

11. The method according to any one of claims 9-10, further comprising, cleaning the surface of the substrate with an organic solvent prior to the step of subjecting the substrate to plasma treatment.

12. The method according to any one of claims 8-11, further comprising, drying the layer of the composition after the layer of composition has been applied to the substrate.

13. The method according to any one of claims 8-12, further comprising, applying at least one of a primer layer, a topcoat layer or mixtures thereof over the layer of the composition.

14. The method according to any one of claims 8-13, wherein the substrate is selected from the group consisting of polymer, fabric, composite material, fiber reinforced polymer.

15. The method according to claim 14, wherein the substrate comprises carbon fiber reinforced plastics.

16. The method according to any one of claims 8-15, wherein the substrate is contaminated with organic and/or inorganic contaminants.

17. The method according to claim 16, wherein the substrate is contaminated with one or more hydrocarbon(s) selected from the group consisting of de-icing fluid, jet oil, jet fuel, hydraulic fluid and degreaser.

18. A coated substrate comprising:

a layer of the composition of any one of claims 1 to 7 that is chemically coupled to a surface of the substrate.

19. The coated substrate according to claim 18, further comprising:

a layer of at least one of a primer, a topcoat or mixtures thereof that is chemically coupled to the layer of the composition.

20. The coated substrate according to claim 19, wherein the substrate has one or more of the following properties: cross-hatch classification of at least 4 as measured by cross-hatch tape test (ASTM D3359), adhesion strength of at least 2 MPa after 6 months of coating as measured by pull-off strength test (ASTM 4541D) at room temperature and adhesion strength of at least 2 MPa after 3 months of coating as measured by pull-off strength test (ASTM 4541D) at 88ºC.