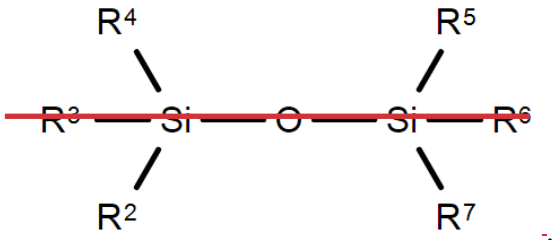
the first coating layer bonding surface is bonded with the first sheet bonding surface, and the second coating layer bonding surface is bonded with the second sheet bonding surface,

wherein the coating layer comprises poly(diphenylsiloxane); and

the monomer comprises a compound of formula $(R^1)_mSi(X^1)_n$, wherein each R^1 is independently an aryl; m is 1, 2 or 3; each X^1 is independently an alkoxy; and n is 1, 2 or 3;



[0010] In an example, the coating layer comprises poly(diphenylsiloxane).

[0011] In another example, the first coating layer bonding surface has a surface energy between 40 and 75 mJ/m^2.

[0012] In another example, the coating layer has a thickness of less than 100 nm.

[0013] In another example, the coating layer is a single layer.

[0014] In another example, the first sheet has a thickness less than 200 μm.

the second sheet using plasma CVD, the coating layer comprising a coating layer bonding surface; and

bonding the coating layer bonding surface to a bonding surface of a first sheet.

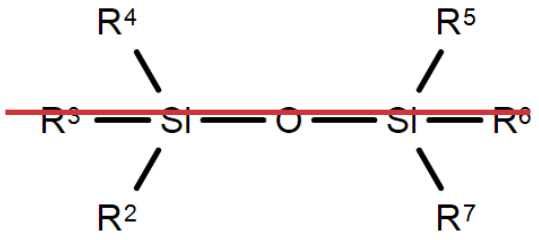
[0034a] In a second aspect, there is a method of making an article comprising:

forming a coating layer comprising a plasma-polymerized organosiloxane compound on a bonding surface of a second sheet by depositing a monomer on the bonding surface of the second sheet using plasma CVD, the coating layer comprising a coating layer bonding surface;

exposing the boding surface to oxygen, nitrogen, or a combination thereof, to increase the surface energy of the coating layer bonding surface before the bonding surface of the first sheet is bonded to the coating layer bonding surface, the surface energy of the coating layer bonding surface being increased to between 40 and 75 mJ/m^2; and

bonding the coating layer bonding surface to a bonding surface of a first sheet,

wherein the monomer comprises a compound of formula $(R^1)_mSi(X^1)_n$, wherein each R^1 is independently an aryl; m is 1, 2 or 3; each X^1 is independently an alkoxy; and n is 1, 2 or 3;



[0035] In an example, the monomer is deposited on the bonding surface of the second sheet using low pressure plasma CVD or atmospheric pressure plasma CVD.

[0036] In an example, the coating layer comprises poly(diphenylsiloxane).

[0037] In another example, the coating layer has a thickness less than 100 nm.

[0038] In another example, the coating layer is a single layer.

[0039] In another example, the first sheet has a thickness less than 200 μm.

[0040] In another example, the coating layer bonding surface is bonded with the first sheet bonding surface with a bond energy of less than 600 mJ/m^2 after subjecting the article to a temperature of 600 °C for 10 minutes in a nitrogen atmosphere.

[0041] In another example, the first sheet is a glass sheet.

[0042] In another example, the second sheet is a glass sheet.

[0043] In another example, the first sheet is a glass sheet and the second sheet is a glass sheet.

[0062] In another example, the change in percent blister area is less than 10 when the article is subjected to a temperature of 600 °C for 10 minutes in a nitrogen atmosphere.

[0063] In another example, the change in percent blister area is less than 5 when the article is subjected to a temperature of 600 °C for 10 minutes in a nitrogen atmosphere.

[0064] ~~In a third aspect, t~~There is an article comprising:

a first sheet comprising a first sheet bonding surface;

a second sheet comprising a second sheet bonding surface; and

a coating layer comprising a first coating layer bonding surface and a second coating layer bonding surface, the coating layer comprising poly(diphenylsiloxane);

the first coating layer bonding surface being bonded with the first sheet bonding surface, and the second coating layer bonding surface being bonded with the second sheet bonding surface.

[0065] In an example, the first coating layer bonding surface has a surface energy between 40 and 75 mJ/m^2.

[0066] In another example, the coating layer has thickness of less than 100 nm.

[0067] In another example, the coating layer is a single layer formed by depositing the monomer.

[0068] In another example, the first sheet having a thickness less than 200 μm.

[0069] In another example, the first coating layer bonding surface is bonded with the first sheet bonding surface with a bond energy of less than 700 mJ/m^2 after subjecting the article to a temperature of 600 °C for 10 minutes in a nitrogen atmosphere, wherein prior to after subjecting the article to a temperature of 600 °C, the first coating layer bonding surface was annealed at a temperature of 400 °C in a nitrogen atmosphere prior to the first coating layer bonding surface being bonded to the first sheet bonding surface.

[0070] In another example, the first coating layer bonding surface is bonded with the first sheet bonding surface with a bond energy of less than 600 mJ/m^2 after subjecting the article to a temperature of 600 °C for 10 minutes in a nitrogen atmosphere, wherein prior to after subjecting the article to a temperature of 600 °C, the first coating layer bonding surface was annealed at a temperature of 400 °C in a nitrogen atmosphere prior to the first coating layer bonding surface being bonded to the first sheet bonding surface.

[0071] In another example, the change in percent blister area is less than 10 when the article is subjected to a temperature of 600 °C for 10 minutes in a nitrogen atmosphere, after the first coating layer bonding surface has been annealed at a temperature

What is claimed is:

1. An article comprising:

a first sheet comprising a first sheet bonding surface;

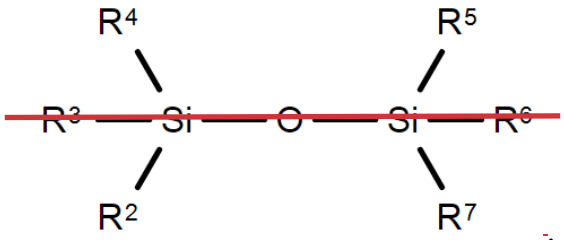
a second sheet comprising a second sheet bonding surface; and

a coating layer comprising a first coating layer bonding surface and a second coating layer bonding surface, the coating layer comprising a plasma-polymerized organosiloxane compound formed by depositing a monomer on at least one of the first sheet bonding surface and the second sheet bonding surface;

the first coating layer bonding surface is bonded with the first sheet bonding surface, and the second coating layer bonding surface is bonded with the second sheet bonding surface,

wherein the coating layer comprises poly(diphenylsiloxane); and

the monomer comprises a compound of formula $(R^1)_mSi(X^1)_n$, wherein each R^1 is independently an aryl; m is 1, 2 or 3; each X^1 is independently an alkoxy; and n is 1, 2 or 3~~;~~



~~2. The article of claim 1, the coating layer comprising poly(diphenylsiloxane).~~

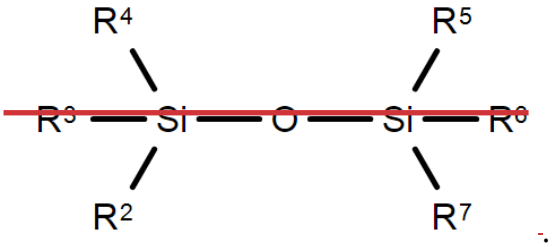
~~3~~2. A method of making an article comprising:

forming a coating layer comprising a plasma-polymerized organosiloxane compound on a bonding surface of a second sheet by depositing a monomer on the bonding surface of the second sheet using plasma CVD, the coating layer comprising a coating layer bonding surface;

exposing the boding surface to oxygen, nitrogen, or a combination thereof, to increase the surface energy of the coating layer bonding surface before the bonding surface of the first sheet is bonded to the coating layer bonding surface, the surface energy of the coating layer bonding surface being increased to between 40 and 75 mJ/m^2; and

bonding the coating layer bonding surface to a bonding surface of a first sheet,

wherein the monomer comprises a compound of formula $(R^1)_mSi(X^1)_n$, wherein each R^1 is independently an aryl; m is 1, 2 or 3; each X^1 is independently an alkoxy; and n is 1, 2 or 3



~~4. The method of claim 3, further comprising exposing the bonding surface to oxygen, nitrogen, or a combination thereof , to increase the surface energy of the coating layer bonding surface before the bonding surface of the first sheet is bonded to the coating layer bonding surface, the surface energy of the coating layer bonding surface being increased to between 40 and 75 mJ/m^2.~~

~~5~~3. The method of claim ~~3~~2, wherein the monomer comprises at least one monomer selected from the group consisting of phenyltrimethoxysilane, phenyltriethoxysilane, dimethoxydiphenylsilane, and diethoxydiphenylsilane.

~~6~~4. The method of ~~any one of~~ claim~~s~~ 2 or claim 3~~-5~~, the coating layer comprising poly(diphenylsiloxane).

~~7~~5. The method of any one of claims ~~3-6~~2-4, further comprising subjecting the coating layer to thermal annealing, at a temperature of at least 300 °C in a nitrogen atmosphere, before the first sheet and the coating layer are bonded.

~~8. An article comprising:~~

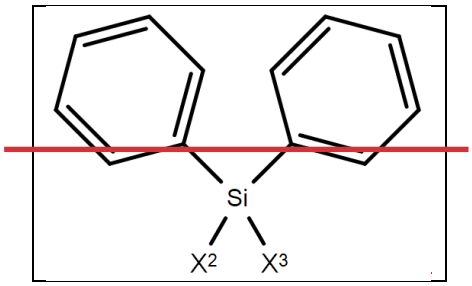
~~a first sheet comprising a first sheet bonding surface;~~

~~a second sheet comprising a second sheet bonding surface; and~~

~~a coating layer comprising a first coating layer bonding surface and a second coating layer bonding surface, the coating layer comprising poly(diphenylsiloxane);~~

~~the first coating layer bonding surface is bonded with the first sheet bonding surface, and the second coating layer bonding surface is bonded with the second sheet bonding surface.~~

~~9. The article of claim 8, the poly(diphenylsiloxane) coating layer formed by depositing a monomer on at least one of the first sheet bonding surface and the second sheet bonding surface, wherein the monomer is deposited on at least one of the first sheet bonding surface and the second sheet bonding surface, the monomer comprising a diphenylsilane compound having the structure below, wherein X^2 and X^3 are independently hydrogen, halogen, hydroxy, alkoxy, amino, aryl, alkyl, alkenyl, alkynyl, or a combination thereof.~~

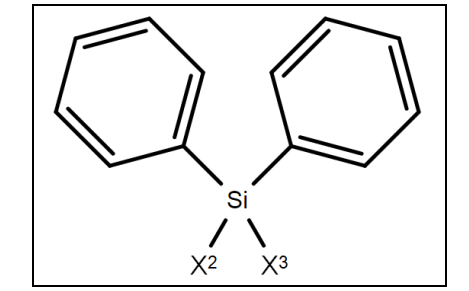


~~10~~6. A method of making an article comprising:

forming a coating layer comprising poly(diphenylsiloxane) on a bonding surface of a second sheet by depositing a monomer on the bonding surface of the second sheet, the coating layer comprising a coating layer bonding surface; and

bonding the coating layer bonding surface to a bonding surface of a first sheet.

~~11~~7. The method of claim ~~10~~6, the monomer comprising a diphenylsilane compound having the structure below, wherein X^2 and X^3 are independently hydrogen, halogen, hydroxy, alkoxy, amino, aryl, alkyl, alkenyl, alkynyl, or a combination thereof.



~~12~~8. The method of claim ~~10~~6 or claim ~~11~~7 further comprising subjecting the coating layer to thermal annealing, at a temperature of at least 300 °C in a nitrogen atmosphere, before the first sheet and the coating layer are bonded.