Claims

1. A photovoltaic module, comprising:

a base substrate;

a photovoltaic device disposed in contact with said base substrate, wherein said photovoltaic device comprises a metal component;

a poly(vinyl butyral) layer disposed in contact with said photovoltaic device, wherein said poly(vinyl butyral) layer comprises a 1 H-benzotriazole salt; and,

a protective substrate disposed in contact with said poly(vinyl butyral) layer.

2. The module of claim 1, wherein said photovoltaic device is a thin film photovoltaic device and wherein said metal component is preferably used as a conductive layer.

3. The module of claim 2, wherein said poly(vinyl butyral) layer comprises 0.001 to 5 weight percent of 1H-benzotriazole salt.

4. The module of claim 2, wherein said poly(vinyl butyral) layer comprises 0.1 to 0.4 weight percent of 1H-benzotriazole salt.

5. The module of claim 2, wherein said poly(vinyl butyral) layer comprises 1 to 5 weight percent of 1H-benzotriazole salt.

6. The module of claim 2, wherein said poly(vinyl butyral) layer further comprises a phenolic antioxidant.

7. The module of claim 2, wherein said metal is bismuth, copper, cadmium, lead, tin, zinc, silver, gold, indium, palladium, platinum, aluminum, antimony, chromium, iron, nickel, rhodium, tantalum, titanium, or vanadium.

8. The module of claim 2, wherein said metal is silver.

9. A polymer interlayer comprising a poly(vinyl butyral) sheet comprising 0.001 to 5 weight percent of 1H-benzotriazole salt, wherein said poly(vinyl butyral) sheet further comprises a phenolic antioxidant.

10. A multilayer laminate comprising

a first substrate;

a metal component disposed in contact with said first substrate;

a poly(vinyl butyral) layer disposed in contact with said metal component, wherein said poly(vinyl butyral) layer comprises a 1H-benzotriazole salt; and,

a second substrate disposed in contact with said poly(vinyl butyral) layer.

11. The multilayer laminate of claim 10, wherein said poly(vinyl butyral) sheet comprises 0.1 to 0.4 weight percent of 1H-benzotriazole salt.

12. The multilayer laminate of claim 10, wherein said poly(vinyl butyral) sheet comprises 1 to 5 weight percent of 1 H-benzotriazole salt.

13. The multilayer laminate of claim 10, wherein said poly(vinyl butyral) sheet comprises 0.001 to 5 weight percent of 1H-benzotriazole salt.

14. The multilayer laminate of claim 10, wherein said poly(vinyl butyral) sheet further comprises a phenolic antioxidant.

15. A method of making a photovoltaic module, comprising: providing

a base substrate;

forming a photovoltaic device on said base substrate, wherein said photovoltaic device comprises a metal component;

disposing a poly(vinyl butyral) layer in contact with said photovoltaic device, wherein said poly(vinyl butyral) layer comprises a 1H-benzotriazole salt; disposing a protective substrate in contact with said poly(vinyl butyral) layer; and, laminating said base substrate, said photovoltaic device, said poly(vinyl butyral) layer, and said protective substrate to form said module.

Claims

1. A photovoltaic module, comprising:

a base substrate;

a photovoltaic device disposed in contact with said base substrate, wherein said photovoltaic device comprises a metal component;

a poly(vinyl butyral) layer disposed in contact with said photovoltaic device, wherein said poly(vinyl butyral) layer comprises:

(i) 0.001 to 5 weight percent of a 1 H-benzotriazole salt; and

(ii) a phenolic antioxidant; and,

a protective substrate disposed in contact with said poly(vinyl butyral) layer.

2. The module of claim 1, wherein said photovoltaic device is a thin film photovoltaic device and wherein said metal component is preferably used as a conductive layer.

3. The module of claim 2, wherein said poly(vinyl butyral) layer comprises 0.1 to 0.4 weight percent of 1H-benzotriazole salt.

4. The module of claim 2, wherein said polyvinyl butyral) layer comprises 1 to 5 weight percent of 1H-benzotriazole salt.

5. The module of claim 2, wherein said metal is bismuth, copper, cadmium, lead, tin, zinc, silver, gold, indium, palladium, platinum, aluminum, antimony, chromium, iron, nickel, rhodium, tantalum, titanium, or vanadium.

6. The module of claim 2, wherein said metal is silver.

7. A polymer interlayer comprising a poly(vinyl butyral) layer comprising 0.001 to 5 weight percent of 1H-benzotriazole salt, wherein said poly(vinyl butyral) layer further comprises a phenolic antioxidant.

8. A multilayer laminate comprising

a first substrate;

a metal component disposed in contact with said first substrate;

a poly(vinyl butyral) layer disposed in contact with said metal component, wherein said poly(vinyl butyral) layer comprises a 1H-benzotriazole salt;

a second substrate disposed in contact with said poly(vinyl butyral) layer; and,

wherein said poly(vinyl butyral) layer further comprises a phenolic antioxidant.

9. The multilayer laminate of claim 10, wherein said poly(vinyl butyral) layer comprises 0.1 to 0.4 weight percent of 1H-benzotriazole salt.

10. The multilayer laminate of claim 10, wherein said poly(vinyl butyral) layer comprises 1 to 5 weight percent of 1H-benzotriazole salt.

11. The multilayer laminate of claim 10, wherein said poly(vinyl butyral) layer comprises 0.001 to 5 weight percent of 1H-benzotriazole salt.

12. A method of making a photovoltaic module, comprising: providing

a base substrate;

forming a photovoltaic device on said base substrate, wherein said photovoltaic device comprises a metal component;

disposing a poly(vinyl butyral) layer in contact with said photovoltaic device, wherein said poly(vinyl butyral) layer comprises a 1H-benzotriazole salt;

disposing a protective substrate in contact with said polyfvinyl butyral) layer; and,

laminating said base substrate, said photovoltaic device, said poly(vinyl butyral) layer, and said protective substrate to form said module.