

EDGE PROTECTED BARRIER ASSEMBLIES

Cross Reference to Related Applications

This application claims priority to U.S. Provisional Patent Application Serial No. 61/515073, filed August 4, 2011 and U.S. Provisional Patent Application Serial No. 61/605,525 filed March 1, 2012.

Background

Emerging solar technologies such as organic photovoltaic devices (OPVs) and thin film solar cells like Copper Indium Gallium di-Selenide (CIGS) require protection from water vapor and need to be durable (e.g., to ultra-violet (UV) light) in outdoor environments. Typically, glass has been used as an encapsulating material for such solar devices because glass is a very good barrier to water vapor, is optically transparent, and is stable to UV light. However, glass is heavy, brittle, difficult to make flexible, and difficult to handle. There has been interest in developing transparent flexible encapsulating materials to replace glass that will not share the drawbacks of glass but have glass-like barrier properties and UV stability, and a number of flexible barrier films have been developed that approach the barrier properties of glass.

Solar devices are used outdoors, and so are exposed to the elements, including wind, water and sunlight. Water penetration into solar panels has been a long-standing problem. Solar panels may also be deleteriously affected by wind and sunlight.

Many flexible barrier films are multi-layer film laminates. Any multi-layer film laminate has the potential for delamination, especially at the edges. Reducing delamination at the edges will improve overall performance of the barrier films.

Summary

According to an aspect of the present invention, there is providedThe present application is directed to an assembly comprising an electronic device; and a multilayer film. The multilayer film comprises a barrier stack adjacent the electronic device, and a polymer weatherable sheet adjacent the barrier stack opposite the electronic device. The assembly additionally comprises an opaque protective layer adjacent the barrier stack opposite the electronic device.

Pending Claims

1. An assembly comprising
an electronic device; and
a multilayer film, the multilayer film comprising
a barrier stack adjacent the electronic device; and
a polymer weatherable sheet adjacent the barrier stack opposite the electronic device, and
an opaque protective layer adjacent the barrier stack opposite the electronic device.
2. The assembly of claim 1 wherein the barrier stack comprises a polymer layer and an inorganic barrier layer.
3. The assembly of claim 2 wherein the inorganic barrier layer is an oxide layer.
4. The assembly of claim 1 wherein the multilayer film is transparent and flexible.
5. The assembly of claim 1 wherein the opaque protective layer is on the barrier stack opposite the electronic device.
6. The assembly of claim 1 wherein the opaque protective layer is on the weatherable sheet opposite the barrier stack.
7. The assembly of claim 1 wherein the opaque protective layer is on the weatherable sheet adjacent the barrier stack.
8. The assembly of claim 1 wherein the opaque protective layer covers the perimeter of the assembly.
9. The assembly of claim 1 wherein the protective layer is an ink layer.