

SOLAR CELL MODULE WITH HIGH ELECTRIC SUSCEPTIBILITY LAYER

TECHNICAL FIELD

[0001] Embodiments of the subject matter described herein relate generally to solar cells, and more particularly to solar cell modules.

BACKGROUND

[0002] Solar cells are well known devices for converting solar radiation to electrical energy. A solar cell has a front side that faces the sun during normal operation to collect solar radiation and a backside opposite the front side. Solar radiation impinging on the solar cell creates electrical charges that may be harnessed to power an external electrical circuit, such as a load.

[0003] Several solar cells may be connected together to form a solar cell array. The solar cell array may be packaged into a solar cell module, which includes protection layers that allow the solar cell array to withstand environmental conditions in the field. Embodiments of the present disclosure pertain to solutions for increasing efficiency and addressing surface degradation mechanisms of solar cells in solar cell modules.

SUMMARY

[0003A] In one aspect, a solar cell module is provided, comprising a plurality of solar cells, the plurality of solar cells having front sides facing the sun during normal operation and backsides opposite the front sides;

a high electric susceptibility layer on the plurality of solar cells, the high electric susceptibility layer having an electric susceptibility of at least 100;

an encapsulant encapsulating the plurality of solar cells; and

a transparent top cover on the high electric susceptibility layer.

[0003B] In one aspect, a solar cell module is provided, comprising a plurality of solar cells, the plurality of solar cells having front sides facing the sun during normal operation and backsides opposite the front sides;

a protective package that encases the plurality of solar cells; and

a first high electric susceptibility layer on the front sides of the plurality of solar cells, the first high electric susceptibility layer having an electric susceptibility of at least 100.

[0003C] In one aspect, a solar cell module is provided, comprising a solar cell;
a protective package that encases the solar cell; and
a first high electric susceptibility layer on the solar cell, the first high electric susceptibility layer having an electric susceptibility of at least 100 and polarized such that a sheet charge is on a surface of the first high electric susceptibility layer that faces toward the solar cell.

[0004] In one embodiment, a solar cell module includes solar cells that are encased in a protective package and a high electric susceptibility layer that is placed on the solar cells. The high electric susceptibility layer is polarized such that a sheet charge is developed at the interface of the high electric susceptibility layer and the solar cells. The protective package includes an encapsulant that encapsulates the solar cells. The encapsulant may be a multilayer encapsulant, with the high electric susceptibility layer being a layer of the encapsulant. The high electric susceptibility layer may also be a material that is separate from the encapsulant.

[0005] These and other features of the present disclosure will be readily apparent to persons of ordinary skill in the art upon reading the entirety of this disclosure, which includes the accompanying drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS