AzTE Arizona Technology Enterprises

www.azte.com

GaAs Solar Cells Using Monolithically Integrated II-VI Semiconductors for Roughened Surfaces

AzTE Case # M12-019P

Inventors

Dr. Yong-Hang Zhang

Professor

School of Electrical, Computer, and Energy Engineering

Ding Ding

Doctorate Candidate, Research Associate

School of Materials

Background

When sunlight interacts with a solar cell the light excites electrons in the cell which are collected as electricity. The solar cell operates more efficiently the longer the light interacts within the cell. This is accomplished by increasing the length of the path the light travels in the cell material. One way this is done is to make the solar cell thicker. Unfortunately, this increases the distance the electrons must travel to the contacts in the solar cell where they are collected allowing them more opportunity to recombine with the cell material. A solar cell is more efficient when it is made thinner, but allows light to travel a longer path in the cell material. Light trapping techniques are common in silicon based solar cells. However, this is more challenging for other material systems.

Invention Description

To address this problem researchers at Arizona State University have developed a method for scattering light by attaching a layer to the back side of thin-film solar cells or other material systems. A roughened layer of ZnSe (zinc selenide) is deposited on the back of the cell. A reflective foil is then attached to the back of the ZnSe layer. This method increases solar cell efficiency because it increases the distance the light travels in the solar cell.

Intellectual Property Status:

Patent Pending

Potential Applications

- Single-junction solar cells
- Multi-junction solar cells
- Infrared Detectors

Benefits and Advantages

- **Lower Costs** – Allows solar cell to produce more watts of electricity per module produced, reducing production costs.
- **More Power** – Allows light to travel further in the active solar cell material, enhancing energy production.
- **Better Efficiency –** Produces more electricity per square meter of solar cell.

Contact

Bill Loux

Director of Business Development, Physical Sciences

Arizona Technology Enterprises, LLC (AzTE)

P: 480.884.1992

F: 480.884.1984

BLOUX@AZTE.COM

TECHNOLOGYVENTURES@AZTE.COM