

Thin Film Solar Cells

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ABSTRACT

We bring our projects to life by capturing sunlight, so that we can transform our ideas into reality and create a more sustainable future. Thanks for 10 years of innovation, our photovoltaic technology is light and can be easily integrated into any object. A thin -film solar cell is a second-generation solar cell that is made by depositing one or more thin layers, or thin film TF of photovoltaic material on a substance such as glass, plastic or metal. Thin-film solar cells are commercially used in several technologies, including cadmium telluride, copper indium gallium diselenide and amorphous thin-film silicon.

KEY WORDS

Thin-film solar cells, photo-voltaic material, solarpanels, cadmium telluride, copper indium gallium diselenide and amorphous thin- film silicon.

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I. INTRODUCTION

Film thickness varies from a few nano meters to tens of micro meters, much thinner than thin-film's rival technology, the conventional, first -generation crystalline silicon solar cells, that uses wafers of up to 200micro metersthick. This allows thin film cells to be flexible and lower in weight. It is used in building -integrated photovoltaics and as semi-transparent photovoltaic glazing material that can be laminated into windows. Other commercial applications use rigid thin film solar panels(interleaved between two panes of glass) in some of the world's largest photovoltaic power stations.

HISTORY

Thin film solar cells are well – known since the late 1970s, when solar calculators powered by a small strip of amorphous silicon appeared on the market/ They are now available in very large modules used in sophisticated building integrated installations and vehicle charging systems

PROBLEM DEFINITION

A thin-film solar cell is a second-generation solar cell that is made by depositing one or more thin layers or thin film (TF) of photovoltaic material on a substrate such as glass, plastic or metal. Thin-film solar cells are commercially used in several technologies including cadmium telluride (CdTe), Copper indium gallium diselenide (CIGS) and amorphous thin-film silicon.

Film thickness varies from a few nano meters (nm) to tens of micro meters, much thinner than thin-film's rival technology, the conventional, first-generation crystalline silicon solar cell (C-Si) that uses wafers of up to 200 micro meterthick. This allows thin film cells to be flexible and lower in weight. It is used in building integrated photovoltaics and as semi-transparent photovoltaics glazing material that can be laminated into windows. Other commercial applications use rigid thin film solar panels in some of the world's largest photovoltaic power stations.

TRANSPARENT SOLAR CELLS

In 2022, semi-transparent solar cells that are as large as windows were reported, after team members of the study achieved record efficiency with high transparency in 2020. Also in 2022, other researchers reported the fabrication of solar cells with a record average visible transparency of 79% being nearly invisible.

II. RESULTS AND DISCUSSION

A team of scientists from the department of Energy's Ames National Laboratory developed a new characterization tool that allowed them to gain unique insight into a possible alternative material for solar cells. Under the leadership of Jiang Wang, senior scientist from Ames lab, the team developed a microscope that used tera hertz waves to collect data on material samples. The team then used their microscope to explore Methyl ammonium Leas Iodide CMA PI3 perovskite, a material that could potentially replace silicon in solar cells.

III. CONCLUSION

A team of scientists has developed a new characterization tool that allowed the scientists to gain unique insight into a possible alternative material for solar cells.

Who invented thin -film solar cell?

This solar technology can be traced back to the 1970s, when Karl Bower Pioneered thin – film solar cell research and created the first solar hose called Solar One

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