# Thin-film solar cell concept

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Micro-concentrator solar cells enable higher power conversion efficiencies and material savings when compared to large-area non-concentrated solar cells. In this study, we use materials-efficient ...

But large-scale terrestrial applications of solar cells still await major breakthroughs in terms of discovering new and radical concepts in solar cell device structures, utilizing relatively more abundant, cheap, and even exotic materials, and inventing simpler and less energy intensive fabrication processes. No doubt, this extraordinary ...

Thin-film solar cells offer the most promising options for substantially reducing the cost of photovoltaic systems. A multiplicity of options, in terms of materials and devices, are ...

Novel Ag-based thin film solar cells have attracted extensive attention in recent years in the photovoltaic (PV) field due to their outstanding properties like a high light absorption coefficient, low toxicity, abundance, and an appropriate band gap. The emerging Ag-based thin film materials such as Ag2S, AgBiS2, Ag3CuS2, AgInS2, AgBiSe2, Ag2ZnSnS4, Ag(In1 ...

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It is expected that the combination of new thin-film PV technologies, e.g., copper indium gallium selenide (CIGS) cells or gallium-arsenide (GaAs) cells, together with Gossamer deployment technologies, could significantly increase the power availability for spacecraft. Based on a requirement, analysis system concepts were evaluated. A focus is on the potential of ...

Thin-film solar cells that are considered as the second generation of solar cells are known for their low cost and acceptable efficiency. In this technology, semiconductor layers with a thickness of micrometer are deposited on thick enough substrates to maintain physical consistency. The relatively low processing temperature helps use substrates of different ...

Recent developments suggest that thin-film crystalline silicon (especially microcrystalline silicon) is becoming a prime candidate for future photovoltaics. The photovoltaic (PV) effect was discovered in 1839 by Edmond Becquerel. For a long time it remained a scientific phenomenon with few device applications.

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After the wrap around contact PVD process is complete a protective Tefzel ® film is applied over the solar cell and contact. The Tefzel ® film is applied to the front of the solar cell to increase the thermal emissivity to 0.8, which limits the peak temperature of the cell from exceeding 80 °C. It also improves the robustness of the solar cell and mitigates possible risk ...

The three major thin film solar cell technologies include amorphous silicon (?-Si), copper indium gallium selenide (CIGS), and cadmium telluride (CdTe). In this paper, the evolution of each technology is discussed in both laboratory and commercial settings, and market share and reliability are equally explored. The module efficiencies of CIGS ...

Thin-film solar cells are a type of photovoltaic device that converts sunlight into electricity using layers of semiconductor materials applied thinly over a flexible substrate. Thin ...

This paper defines the concept and classification of Ag-based materials and introduces in detail a thin film preparation method by overcoming structural defects. Finally, the vision of achieving high-efficiency ATFSCs by improving structural defects is proposed.

If thin-film solar continues to scale in the commercial sector and penetrate the residential market, CIGS will be the technology to achieve it. Sharp Solar has stated that they can produce a 30% efficiency CIGS cell - a feat that would revolutionize the concept of thin-film solar.

ELSEVIER Solar Energy Materials and Solar Cells 49 (1997) 35-44 Solar Energy Materiels and Solar Cells Towards high-efficiency thin-film silicon solar cells with the "micromorph" concept J. Meiera"*, S. Dubaila, R. Platza, P. Torresa, U. Krolla, J.A. Anna Selvana, N. Pellaton Vauchera, Ch. Hofa, D. Fischera, H. Keppnera, R. Fliickigera, A. Shaha, V. ...

Thin-film solar cells offer the most promising options for substantially reducing the cost of photovoltaic systems. A multiplicity of options, in terms of materials and devices, are currently being developed worldwide.

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