Capital Omnidirectional Solar Cells

Why is omnidirectional performance important for c-Si solar cells?
Mechanism behind omnidirectional performance was explained by optical simulation. Seeking efficient light trapping structures with both superior omnidirectional and electrical performance is always on the way for increasing electrical energy outputof c -Si solar cell over a wide range of light incident angle (th).

How omnidirectional solar cell performance is achieved?
Tilt angle control of quasi-periodic IP was achieved by varying Cu and Ni ratio. 0.36% absolute increase in solar cell efficiency was made based on 64° IP. ~5.8% relative increase of output power was achieved on 64° IP based cell. Mechanism behind omnidirectional performance was explained by optical simulation.

What is crystalline silicon (c-Si) solar cell?
Crystalline silicon (c -Si) solar cell,as a representative form of sustainable device for the direct sunlight-to-electricity conversion,has occupied most of the market share in photovoltaic area due to its merits including high power conversion efficiency (i),mature fabrication technology,earth-abundant element storage and so forth [1,2].

What is the difference between MP based and IP based solar cells?
Compared with the conventional MP,the optimized IP like arrays with a d of 64° possess both much lower light reflectance and carrier recombination,leading to a corresponding solar cell with a higher i (~19.67%) than that of MP based counterpart (~19.31%).

What is the difference between a micro pyramid and a solar cell?
Interestingly,compared with the conventional micro pyramid (MP),the optimized inverted pyramid (IP) like arrays with a d of 64° possess both lower light reflectance and carrier recombination,leading to a corresponding solar cell with a higher efficiency(~19.67%) than that of MP based counterpart (~19.31%).

This work not only demonstrates the significant role of d on both superior omnidirectional and electrical performance of c-Si solar cells, but also open up a new window ...

Reducing reflectivity and maximizing the absorption of light are the prime goals for efficient photoelectric conversion in solar cells, anti-glare in sophisticated optical instruments, and video stealth technology. Therefore, ...

In this work, we propose an integrated omnidirectional strategy for designing non-volatile solid additives. By validating the method on the 4,5,9,10-pyrene diimide (PyDI) ...

The efficiency of solar cells covered by silica nanospheres has improved significantly with a maximum of

11.41% at 119 nm diameter while that of the planar solar cells ...

Large-scale (156 mm × 156 mm) quasi-omnidirectional solar cells are successfully realized and featured by keeping high cell performance over broad incident ...

Broadband and omnidirectional antireflection coating is generally an effective way to improve solar cell efficiency, because the destructive interference between the ...

(a) examples of a dirty solar cell surface (while arrows); (b) a damaged panel (red arrows) due to formation of hot spots on a crystalline-silicon module; and (c) a self ...

The heterojunction solar cells fabricated with hierarchical structures exhibit the efficiency of 15.14% using cost-effective as-cut Czochralski n-type Si substrates, which is the highest ...

Quasi-omnidirectional perovskite solar cell with ultra-thin absorber has been prepared. o Efficient light trapping has achieved by employing crater-textured substrates. o ...

Controllable nanoscale inverted pyramids for highly efficient quasi-omnidirectional crystalline silicon solar cells Xu Haiyuan1, Zhong Sihua1, Zhuang Yufeng1 ...

Integrated Omnidirectional Design of Non-volatile Solid Additive Enables Binary Organic Solar Cells with Efficiency Exceeding 19.5%. Ya-Ting Wang #, Wen-Jing Sun ...

The BackPEDOT solar cells with Si NW AR structures in front of the device were fabricated using the MACE method. These cells demonstrated an optimum PCE of 14.5%. The ...

Broadband and omnidirectional antireflection coating is a generally effective way to improve solar cell efficiency, because the destructive interference between the reflected and input waves could ...

As the power conversion efficiency (PCE) and the internal resistance of solar cells were related to cell size and conductivity. 43 A large size solar cell (such as Figure 5a) ...

The microscaled hierarchical Si heterojunction solar cells fabricated with hydrogenated amorphous Si layers on as-cut Czochralski n-type substrates show a high short ...

The microscaled hierarchical Si heterojunction solar cells fabricated with hydrogenated amorphous Si layers on as-cut Czochralski n-type substrates show a high short-circuit current ...

The EQE of both V-groove and pyramid solar cells is found to decrease with the increase of th. However, EQE of V-groove solar cells exhibits a more gradual decrease as ...

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Abstract: A low-profile circularly polarized (CP) omnidirectional metasurface antenna is developed and integrated with solar cells. The proposed metasurface consists of an array of 4 × 4 square ...

The comprehensive design approach is established with coupled optical-electrical simulation for perovskite-based solar cell, which emerged as one of the most ...

J.Phys.D:Appl.Phys.53(2020)483001 TopicalReview Figure1. Schematicdiagramsoftheinteractionsbetweenlightandc ...

Web: https://centrifugalslurrypump.es