Polycrystalline silicon solar cell research

Are poly-Si thin-film solar cells suitable for photovoltaics?
The present article gives a summary of recent technological and scientific developments in the field of polycrystalline silicon (poly-Si) thin-film solar cells on foreign substrates. Cost-effective fabrication methods and cheap substrate materials make poly-Si thin-film solar cells promising candidatesfor photovoltaics.

Are polycrystalline silicon based solar cells resonable?
Basic polycrystalline silicon based solar cells with a total area efficiency of app. 5% has been fabricated without the involvement of anti-reflecting coating. This is a resonable resultconsidering that comercial high efficiency solar cells have a con-version efficiency of about 22%,as outlined in chapter 1.

What are the advantages of polycrystalline silicon compared to wafer-based solar cells?
Fabricated as thin layers,polycrystalline silicon also features all advantages of thin-film technologies,namely low costs due to low material wastage with up to factor 100 less materialcompared to wafer-based solar cells,and the technically feasible monolithic fabrication of large area devices.

What are silicon-based solar cells?
Silicon-based solar cells,which represent an important proportion of commercially available devices,are shortly addressed. Several available processes to obtain polycrystalline silicon,which can be classified basically by the temperature range involved in the overall process,are presented.

Why is metallurgical silicon important for solar cell technology?
The production of polycrystalline silicon is a very important factor for solar cell technology. Brazil produces metallurgical silicon by reserving the quartz, which is a raw material. Brazil is one of the world's largest manufacturer of metallurgical silicon by quartz.

How effective are crystalline silicon thin-film solar cells?
With an appropriate light trapping concept crystalline silicon thin-film solar cells can principally reach single-junction efficiencies of more than 17%close to that of silicon wafer-based solar cells,as calculated by Brendel in 1999 .

A research project is under way at The University of New South Wales aiming at the realisation of a novel type of polycrystalline silicon thin-film solar cell on glass. The idea is to first create a thin large-grained polycrystalline seed layer on glass by aluminium-induced crystallisation of amorphous silicon and then to epitaxially thicken ...

Performances of thin film polycrystalline silicon solar cell grown on glass substrate, using solid phase crystallization of amorphous silicon can be limited by low ...

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Undoubtedly, crystalline silicon solar modules represented by polycrystalline silicon (poly-Si) and monocrystalline silicon (c-Si) play a dominant role in the current photovoltaic market.

The investigation of multi-crystalline silicon (mc-Si) surface etching technology is a key point in solar cell research. In this paper, mc-Si surface was etched in the common alkaline solution ...

Polycrystalline silicon (poly-Si) thin films are fabricated by aluminum-induced crystallization (AIC) of amorphous silicon suboxide (a-SiOx, x = 0.22) at 550 °C for 20 h.

Perovskite solar cells are recent discovery among the solar cell research community and possess several advantages over conventional silicon and thin film based solar ...

A novel seed layer-based poly-Si solar cell concept on glass-ALICIA (aluminium-induced crystallisation, ion-assisted deposition)-is presently being developed at the University of New ...

Thin-film silicon solar cells 241, thin films of alternate materials like cadmium telluride or copper-indium diselenide242, organic solar cells243, perovskite solar cells244, and dye-sensitised ...

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Enhancement of efficiency in monocrystalline silicon solar cells Jinyue Mao School of Physics, Shandong University, Jinan, 250100, China 202100101152@mail.sdu .cn

The fo-cus of this thesis is to fabricate a functional solar cell using phosphorus as dopant on polycrystalline p-type silicon substrates. Furthermore the aim is to investigate the ...

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