Poly-crystalline Black Silicon Solar Cell Solarspace

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.

What is a black silicon solar cell?
Black silicon is layered on the front surface, usually with another passivation layer. In a recent study by Savin et al. [6], they have reported a record-breaking b-Si solar cell efficiency of 22.1% using an IBC configuration. Fig. 12 (b) shows the configuration of the solar cell used in their study.

Is black silicon a good material for photovoltaics?
Black silicon would also appear to be an ideal material for photovoltaicsdue to its outstanding light management properties under the solar spectrum. In addition to boosting efficiency,b-Si can provide significant savings in manufacturing costs as there is no need to deposit a separate antireflection coating.

What is the potential of polysilicon solar cells?
Potential of polysilicon solar cells 3.1. Confinement of lightSilicon is a material with an indirect band gap which absorbs light up to a few microns thin layer. In solar cells,the material should be a good absorber so that the imposing light is confined to achieve high absorbance .

How efficient are monocrystalline solar cells?
Monocrystalline solar cells reached efficiencies of 20%in the laboratory in 1985 (ref. 238) and of 26.2% under 100× concentration in 1988 (ref. 239). In this period,the efficiency of industrial solar cells slowly grew from 12% to 14.5%.

How efficient are p-type crystalline silicon solar cells with hole-selective passivating contacts?
Int. 32,45-56 (2016). Yan,D.,Cuevas,A.,Phang,S. P.,Wan,Y. &Macdonald,D. 23%efficient p-type crystalline silicon solar cells with hole-selective passivating contacts based on physical vapor deposition of doped silicon films. Appl. Phys. Lett. 113,61603 (2018).

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