Low reflectance of sub-texturing for monocrystalline Si solar cell

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Abstract : We investigated novel surface treatment and its impact on silicon photovoltaic cells. Using 2-step etching methods, we have changed the nanostructure on pyramid surface so that less light is reflected. This work proposes an improved texturing technique of monocrystalline silicon surface for solar cells with sub-nanotexturing process. The nanotextured silicon surface exhibits a lower average reflectivity (~ 4%) in the wavelength range of 300 –1100nm without antireflection coating layer. It is worth mentioning that the surface of pyramids may also affect the surface reflectance and carrier lifetime. In one word, we believe nanotextruing is a promising guide for texturization of monocrystalline silicon surface.

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