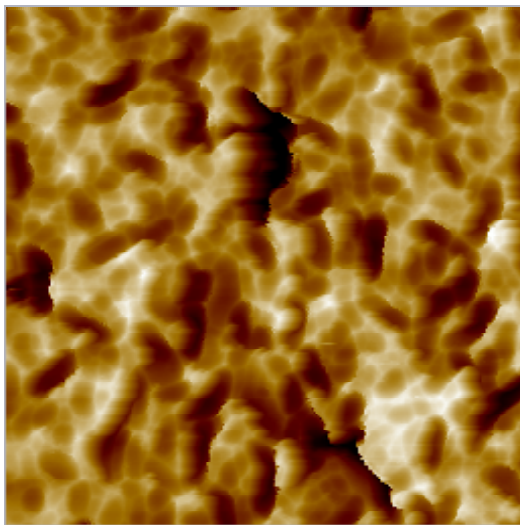


Roughness of Solar Cell Layers

Nanosurf® - easyScan 2 AFM LS Application Note No. 00288

Thin-film polycrystalline-Si solar cells on have a large potential for cost reduction. However, good electrical and crystal layer properties are necessary to reach competitive energy conversion efficiencies. These choice of the base substrate is crucial. Usual substrates are generally quite rough and not transparent which is a disadvantage for solar cell processing. The substrate roughness has a large effect on all aspects of our pc-Si solar cell process.



polycrystalline-Si solar cell surface. Scan range 90µm x 90µm; Z range 7.6µm

A smoother substrates lead to a bigger grain size in the absorber layer and to an increase in generated voltage and efficiency of the resulting solar cells. On the other hand, the efficiency of hydrogenated amorphous silicon solar cells can be significantly improved when enhancing the light absorption in the thin layers by introducing light scattering at rough surfaces. Therefore it is important to investigate the roughness of solar cell.

AFM can provide precise, qualitative and quantitative roughness measurements of surfaces. The image shows the topography of the P-doped polycrystalline-Si layer of a solar cell.

Can be measured with: Mobile S
Nanite B
easyScan 2 AFM

Application domain: Coating
Material Science
Semiconductor