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FÉDÉRALE DE LAUSANNE

EPFL STI IMT-NE PV-LAB

Seminar

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Rue A.-L. Breguet 2, CH-2000 Neuchâtel

Silicon heterojunction solar cell with amorphous silicon oxide buffer and microcrystalline silicon oxide contact layers

Dr. Kaining Ding
IEK-5 Photovoltaik
Forschungszentrum Jülich GmbH

ABSTRACT

We report on the developent and optimization of intrinsic amorphous silicon oxide passivation layers and doped microcrystalline silicon oxide contact layers for silicon heterojunction solar cells. We present the structural, optical, electrical and passivation properties of these PECVD grown layers under various deposition conditions and show the solar cell results of the complete device Ag/ITO/µc-SiOx:H<n>/a-SiOx:H<i>/c-Si<p>/a-SiOx:H<i>/µc-SiOx:H<p+>/ITO/Ag with respect to the layer properties. With optimized buffer, emitter and back surface field layers, a highest efficiency of 19.0 % (active area = 0.67 cm²) was achieved with Voc = 667 mV, short circuit current Jsc = 35.8 mA/cm² and FF = 79.6 % on flat p-type float zone wafer.