

Photovoltaics: Novel Technologies. Reliability

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Abstract

In recent years the photovoltaics (PV) market has been growing at a rapid pace due to various factors related to the environment and economy. Three novel PV technologies (inorganic materials, organic materials, and cross-cutting science and hybrid materials) appeared. Recent breakthroughs indicate that useful phenomena, such as carrier multiplication, can occur efficiently in certain nano-structured materials, offering an opportunity to enhance the efficiency of photovoltaic devices. This paper analyses these new technologies as well as some of the related reliability aspects.

Keywords: Solar cells, novel PV technologies, amorphous hydrogenated silicon (a-Si:H) thin film, reliability, GaInP/GaAs, GaInP/GaAs/Ge, Cu(InGa)Se₂ and CdTe cell efficiencies.