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Laser-ablated nanoparticles for hybrid photovoltaics

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Hybrid solar cells of inorganic and organic materials mark an important class of next generation solar cells, since they combine the advantages of inorganic materials, such as high stability, with the advantages of organic materials, such as tailoring of band gaps and potential low cost production.

We introduce laser-ablated nanoparticles into hybrid solar cells. The production of functionalized TiO2 nanoparticles via laser ablation in liquid is achieved with two approaches, using a TiO2 particle suspension as target and a solid titanium target [1]. The crystallinity of the active layer is investigated with X-ray diffraction (XRD) and grazing incidence wide angle X-ray scattering (GIWAXS). The hybrid solar cells show high fill factors and open circuit voltages underlining the potential of the novel material and the environment-friendly processing method.

[1] Körstgens et al., Nanoscale 9, 2900 (2015).

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