

Zinc oxide nanocrystals: mesoporous scaffolds for PSCs with ultra-long recombination times

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Semiconducting zinc oxide (ZnO), due to its high electron mobility, is a very promising material for constituting electron-transporting layer in perovskite solar cells. However, on the other hand, it is not often used due to difficulties with the synthesis of ZnO not exhibiting charge recombination, nor poor chemical stability in aqueous acidic and basic media. Overcoming these drawbacks cannot be possible without careful design and synthesis of ZnO-organic layer core-shell nanostructures.

We present new synthetic approaches enabling for stable oligoethylene glycol-coated ZnO nanocrystals, in which inorganic core-organic shell interface works as a hole stabilizer dramatically slowing down charge recombination process (recombination times up to microseconds).¹ Moreover, we present the synthesis of ZnO porous materials for the application as scaffold layers in perovskite solar cells. Finally, we will discuss perspectives of application of the obtained materials in construction of functional solar devices.

1. A. M. Cieślak et al. *Nano Energy* **2016**, *30*, 187–192 .

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