

Polyoxometalate as novel materials for Perovskite Solar Cells

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Perovskite solar cells (PSCs) have been gaining great attention due to their low cost and high efficiency. However, reproducibility and stability problems are main disadvantages must be solved for large area production and commercialization.

Here we report interface engineering for improving the stability and reproducibility of PSCs. Polyoxometalates (POMs) which are interesting clusters and exhibit excellent optical and electrochemical behaviours used as surface modification agent at c-TiO₂ and perovskite interface. Modification of c-TiO₂ surface with POM derivatives leads decrease in pin holes on c-TiO₂ surface and thus efficiency increases. The average increase in efficiency is around 20% in comparison with reference PSC. Besides using POMs as surface modification material, they also used as electron transport layer in inverted type of PSCs. The results show that POMs are extremely interesting material as electron transport layer as well as a material for interface engineering.