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Electron transporting material for Perovskite and Organic hybrid solar cell

We introduce a new electron transporting material (ETM) made of zinc cadmium sulfide and titanium oxides. This new material has shown significant enhancement in efficiency of photovoltaic device such as Perovskite, Organic, and Dye Sensitized Solar Cell. In this study, zinc cadmium sulfide suspension was added to titanium oxide sol-gel. The addition of zinc cadmium sulfide helps reduce energy level and increase electron transfer in electron transporting layer compared to that in the pristine titanium dioxide film. At the optimum addition of ZnCdS, at least 20% percent improvement of photovoltaic devices were of observed. The mixture was prepared at room temperature and deposited to each photovoltaic device via rapid convective deposition, in which one-fifth of materials were consumed compared with traditional spin coating technique. With the new ETM and convective deposition technique, high efficiency and low cost Perovskite (> 10%PCE) or Organic hybrid solar cell (>5% PCE) can be fabricated.

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