Efficiency enhancement of perovskite solar cells by using Ag- or Ag-Cu composite-doped surface passivation of the electron transport layer

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Energy has become the forefront issue for much of the economic and social development. The success of clean energy technology is clearly needed for our future sustainable society. Perovskite solar cell represents one of the most promising solar energy technologies due to its potentially low cost, ease of fabrication, good prospect of performance, and environmental benignity. Nevertheless, its photovoltaic performance still needs to be further improved in order to make this technology cost-effective, which eventually leads to viable commercialization. This work presented one simple approach to enhance the performance of perovskite solar cells, i.e., via introduction of a thin passivation between the electron transport and the perovskite layers. The experiments showed that using Ag- or Ag-Cu composite-doped TiO\textsubscript{2} nanotubes as a passivation layer could significantly enhance electron mobility within the device that resulted in a boost of power conversion efficiency from 9.86% to 14.61%. The reported findings offer a simple, yet powerful, approach to enhance solar cell performance, as well as good potential for various perovskite recipes and structures. Such contributions are consistent with the affordable/clean energy and the climate action SDG goals.

Reference: