



## Printable Thin Film Organic/Perovskite Solar Cells: From Materials to Device Stability

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■ Printing has been considered as the most power technology for precision additive manufacturing of organic electronics. In Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), the printed photovoltaic research group has been working on printing process for organic/perovskite solar cells for several years. With the efforts we have made, we are now able to print transparent silver nanowires (AgNW) electrode with highly balanced conductivity and transparency,[1,2,3] highly conductive ZnO interfacial materials to smooth the interface charge transport and injection[4], as well as the photoactive layer with favorable nanophase separation[5], and a highest power conversion efficiency of over 17% was successfully achieved for 1 cm<sup>2</sup> flexible PET substrate. By proper interfacial protection, degradation of OPVs can also be minimized, yielding a  $T_{80}$  over 25,000 hours.[6] In this presentation, I will give a brief introduction on these recent achievements.

### ■ References

- [1]. Wang, Z.; Han, Y.; Yan, L.; Gong, C.; Kang, J.; Zhang, H.; Sun, X.; Zhang, L.; Lin, J.; Luo, Q.; Ma, C.-Q. *Adv. Funct. Mater.* **2021**, *30* (4), 2007276.
- [2] Sun, S.; Zha, W.; Tian, C.; Wei, Z.; Luo, Q.; Ma, C.-Q.; Liu, W.; Zhu, X. *Adv. Mater.* **2023**, 2305092
- [3] Zha, W.; Chen, L.-M.; Sun, S.; Gao, X.; Han, Y.; Liu, T.; Luo, Q.; Chao, Y.-C.; Zan, H.-W.; Meng, H.-F.; et al. *Solar RRL* **2023**, 2300322
- [4]. Wang, Z.; Guo, J.; Pan, Y.; Fang, J.; Gong, C.; Mo, L.; Luo, Q.; Lin, J.; Ma, C.-Q. *Energy Environ. Mater.* **2023**, e12592
- [5]. Sang, L.; Chen, X.; Fang, J.; Xu, P.; Tian, W.; Shui, K.; Han, Y.; Wang, H.; Huang, R.; Zhang, Q.; Luo, Q.; C.-Q. Ma *Adv. Funct. Mater.* **2023**, 2304824.
- [6] Liu, B.; Qin, J.; Wu, N.; Osterbacka, R.; Luo, Q.; Fang, J.; Tan, H.; Ma, C.-Q. *Manuscript under submission.*

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