

Printed organic solar cells with in- situ characterization methods



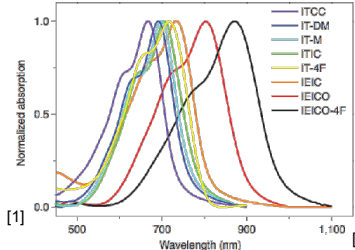
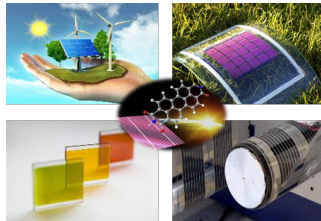
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Organic solar cells with non-fullerene acceptors (NFAs)



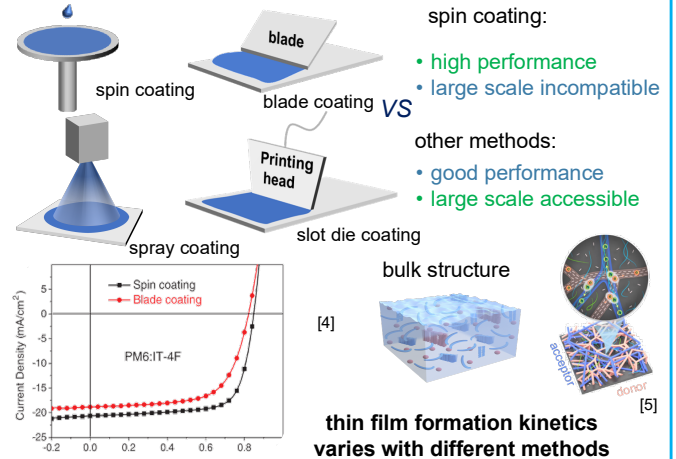
- OSCs:
- environment friendly
- light weight
- semi-transparency
- large-scale fabrication



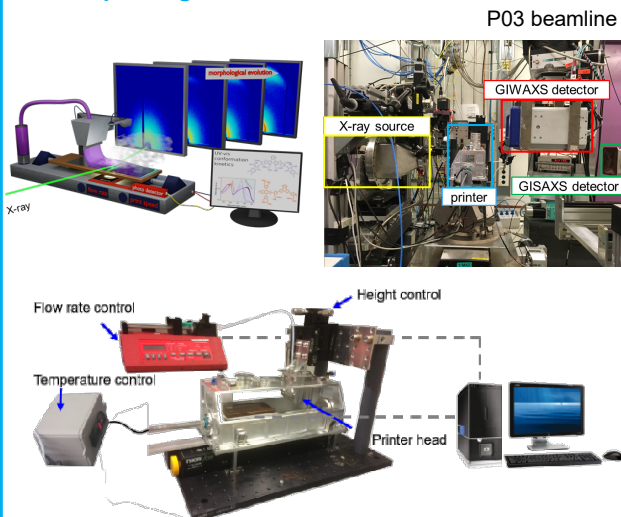
NFA: **19%**

- wide absorbance
- high crystallinity

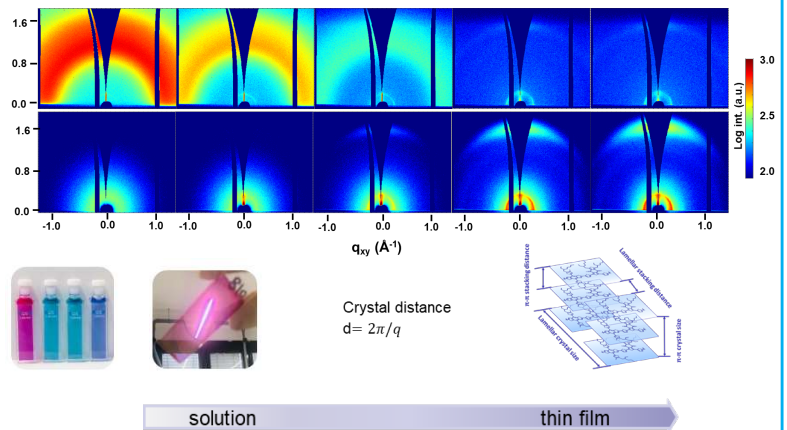
Fabrication methods



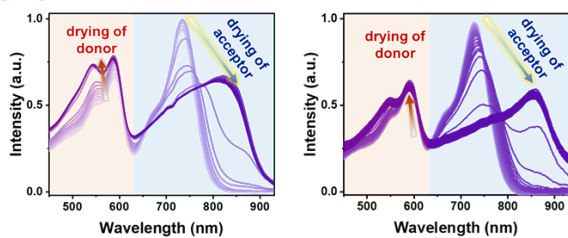
In-situ printing of the OSC thin films



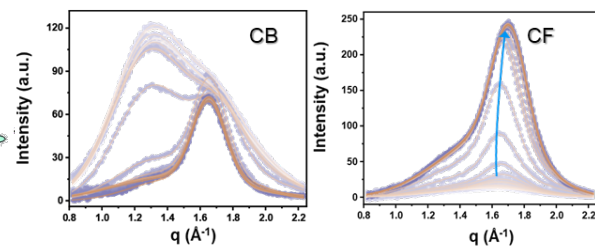
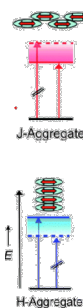
Crystallinity formation kinetics (in situ GIWAXS)



Aggregation and conformation kinetics (in situ UV-vis)



- donor blueshift (H aggregates) while acceptor redshift (J aggregates) during drying in both solvents.
- acceptor undergoes serious redshift (J aggregates) in the CB solvent.

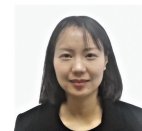


- the crystallization of blend films decreases with CB while increases with CF
- the shifts of peak position and FWHM suggest the crystal growth during solvent evaporation

References

- [1] mse.gist.ac.kr/ospl.com.
- [2] G. Zheng, et al., MRS Bulletin, 38, 320-325 (2023).
- [3] J. Hou et al., Nat. Mater., 2018, 17, 119.
- [4] L. Zhu et al., Nat. Mater., 2022, 23, 4215.
- [5] metsolar.eu/products/met-flexible.com.

Dr. Xinyu Jiang finished the PhD study from TU Munich and becomes a Postdoc at DESY FS-SMA group since 2023.07. My research interest is on scaling-up of the high performance of organic solar cells.



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