

Bo Xiao

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EDUCATION

Wuhan University

M.E., Materials Science and Engineering

09/2022 - 06/2025(Expected)

- GPA: 3.38/4.0
- Supervisor: Prof. Jie Min

Huazhong University of Science & Technology

B.E., Functional Material

09/2018 - 06/2022

- GPA: 3.7/4.0

PUBLICATION

- **Xiao, B.#**, Unraveling the Formation Process of an Organic Photovoltaic Active Layer during High-Speed Coating via a Synergistic Concentration-Temperature Gradient Control Strategy, under review at *Advanced Functional Materials*, accepted at *Advanced Functional Materials*.
- Gao, Y.#, **Xiao, B.#**, Wang, S. & Jie, M.* (2023). Narrow bandgap molecular dyads Incorporating Y-series acceptor backbones for efficient single-molecular organic solar cells. *Sci. China Chem*, 66, 3205.

RESEARCH EXPERIENCE

A framework for understanding high throughput processibility of OPV

11/2023 - present

Team leader

- Comparing the Low/high-speed processing performance of 30 acceptor materials from four star acceptor series. Material property trends that facilitate high-throughput and low-cost device fabrication were identified.
- Calculate the fluid dynamics during the film formation process using COMSOL simulations, and the liquid-to-solid phase transition was monitored through in-situ measurements.
- Using Hansen solubility parameters (HSP) model to calculate the HSP distances between the solvent, donor, and acceptor. A formula was then established to elucidate the relationship between HSP parameters and the crystallization process.
- The spreading dynamics and critical crystallization concentration of the acceptor solutions were studied

High-throughput printing of organic solar cells

5/2023 - 10/2023

Team leader

- The impact of high-speed blade coating conditions on the film formation process was analyzed, increasing the coating speed of the organic photovoltaic active layer from 1 m/min to 6 m/min.
- Film formation process was optimized by coordinating adjustments to process parameters, resulting in the highest-efficiency Layer-by-Layer (LbL) devices under high-speed blade coating. The effectiveness of this method was further confirmed using other solvents.

- In-situ characterization techniques were employed to monitor the duration of the crystallization stage as the process parameters were varied.

Research about single-molecular organic solar cells

9/2022 - 4/2023

Team number

- Contributed to the characterization of the electrical properties, carrier dynamics, and recombination behavior of the devices.
- Gained proficiency in basic device fabrication processes and various post-treatment techniques, including Solvent Vapor Annealing (SVA) and Thermal Annealing (TA), leading to optimized device efficiency.

CONFERENCE:

- Sino-Germany Workshop on printable photovoltaics, Erlangen, Germany (Presentation, on behalf of Prof. Jie Min, Title: Modification of metastable phase in organic solar cells-degree of polymerization)
- The 4th National Conference on Organic Field-Effect Transistors & The 2nd International Conference on Flexible Printed Optoelectronic Materials and Devices, Xi an, China

PATENTS:

- **Bo Xiao**, Rui Sun, Jie Min, "A deposition method and device for high-throughput printing of organic solar cells", Invention patent, CN117563877A
- **Bo Xiao**, Rui Sun, Jie Min, "A Fabrication method for organic solar cells without interface layer" Invention patent, CN117563877A

HONOR:

- Scholarship for Outstanding Students in 2023

SKILLS:

- Language: English, Chinese
- Research: Laser, Doctor blade/ Slot-die, In-situ PL, in-situ UV-vis absorption, GIWAXS, AFM, EQE, UV-vis absorption, TPV/TPC, Photo-CELIV, CE.
- Software: HSPip (Hansen-solubility measurement), COMSOL(Microfluid simulation), Hugo (Website control)