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HIGH-SPEED PEROVSKITE LED FABRICATION BY INKJET PRINTING

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Value Proposition: *New method that improves high speed fabrication of all-inkjet printed PeLEDs for use in display technologies.*

Technology Description

Researchers at Washington University in St. Louis have developed a method of fabricating perovskite LEDs (PeLEDs) directly on an elastic substrate, in which every layer is patterned solely using a highly scalable inkjet printing process. Compared to PeLEDs made using conventional microfabrication processes, this method significantly shortens the fabrication time by at least ten-fold, allowing for high-performance flexible PeLEDs to be manufactured over a larger area at extremely low cost and fast speed, which could facilitate the adoption of the promising PeLED technology in the emerging foldable displays, smart wearables, and many other applications.

Stage of Research

Achieved a turn-on voltage, maximum luminance intensity, and maximum current efficiency of 3.46 V, 10227 cd/m2, and 2.01 cd/A, respectively for flexible PeLEDs printed directly in ambient conditions.

Publications

- Zhao J, Lo L-W, Wan H, Mao P, Yu Z, Wang C. (2021). High-speed fabrication of all-inkjet-printed organometallic halide perovskite light-emitting diodes on elastic substrates. *Advanced Materials*, 33(48): 2102095.

Applications

- Fabrication of flexible perovskite LEDs (PeLEDs) for foldable displays, smart wearables, etc.

Key Advantages

- Fabricates flexible PeLEDs at low cost and fast speed (ten-fold)
- Fabrication process can be accomplished with only one inkjet printer in the ambient environment, significantly lowering the cost

Patents

Patent application filed

Related Web Links – Chuan Wang Profile; Wang Lab