

All-solution-processed infrared to visible organic upconversion device

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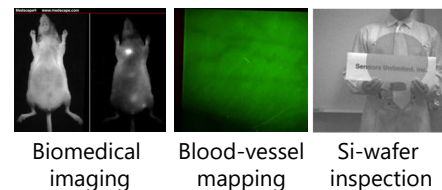
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Introduction

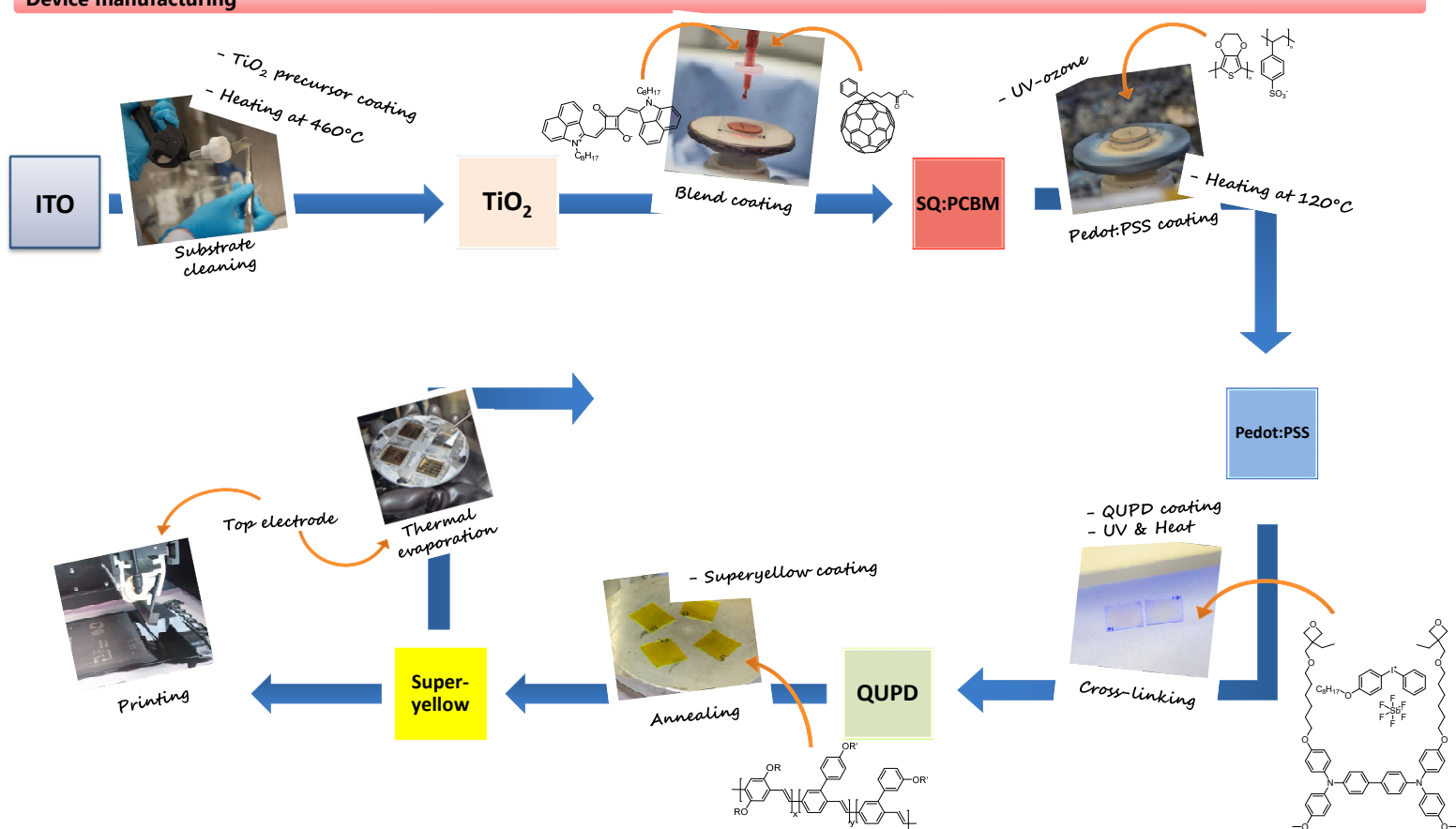
- Organic NIR upconverter (OUC) combines an organic photodetector (OPD) with an OLED
- OUCs convert NIR light directly to visible light
- No all-solution-processed OUC reported
- Advantages of solution processable devices: Cheap, large-area, energy-efficient and fast manufacturing
- Challenges: Dewetting, dissolution of underneath layer

Applications

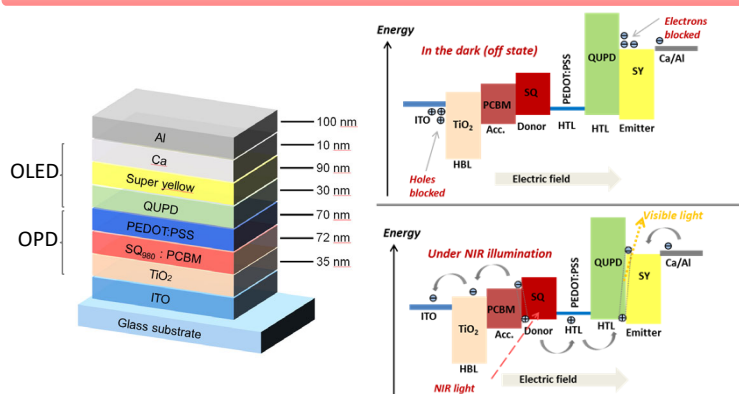


Results

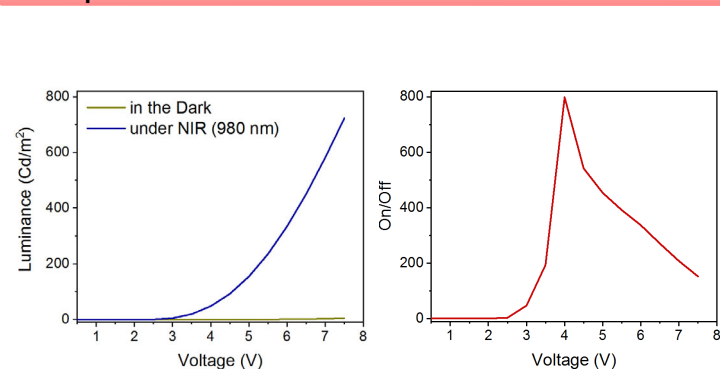
Device manufacturing



Device mechanism



Device performance



Conclusions

- An all-solution processed OUC was fabricated for the first time
- OUCs can be used for non-destructive imaging methods in medical applications, night-vision, Si-wafer inspection
- Preventing dissolution of underneath layers: Orthogonal solvents, UV-surface treatment, thickness optimization, annealing and cross-linking

Acknowledgement

- This work was supported by the Brazilian-Swiss Joint Research Programme (BSJRP)
- Pictures: www.ipbio.org.br/; www.medscape.com; www.astrainc.co.jp/sui_wafer_inspection.jpg