# Supporting Information

**A Stable, Efficient Textile-based Flexible Perovskite Solar Cell with Improved Washable and Deployable Capabilities for Wearable Device Applications**

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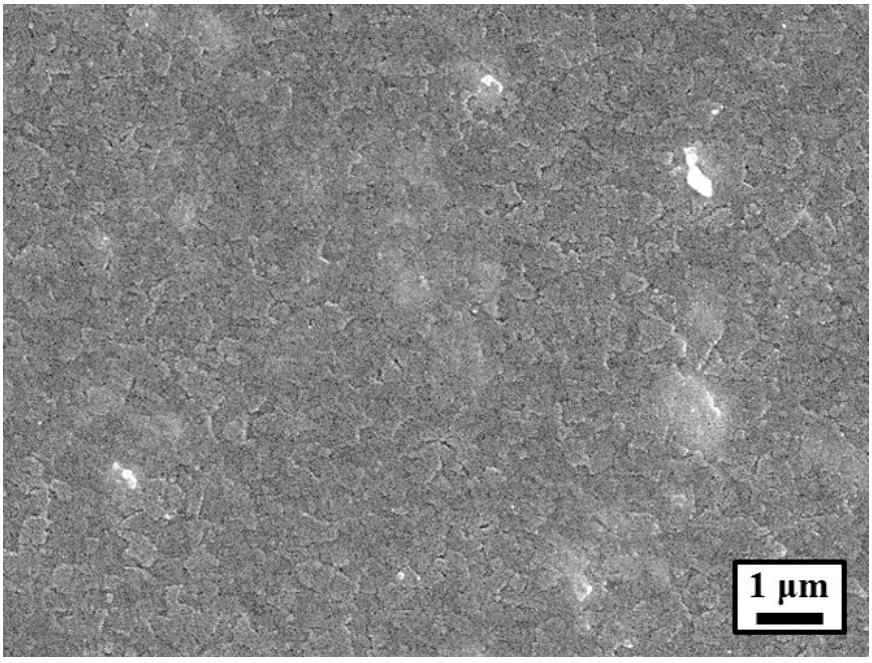


**Figure S1.** The top-view SEM image of the electrodeposited $SnO_2$ film on an ITO/glass substrate.

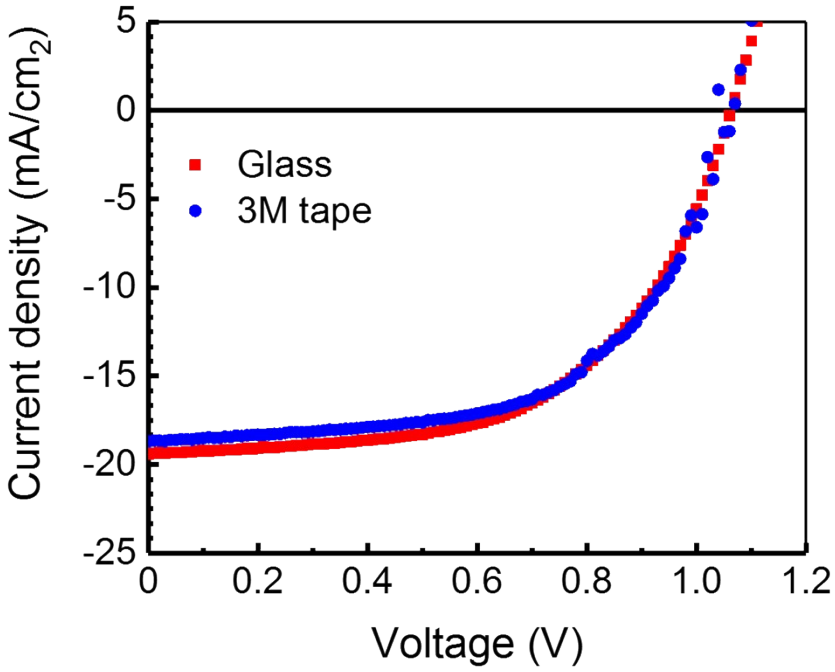


**Figure S2.** The *J-V* curves of the studied glass-based PVSCs (using $SnO_2$ ETL) using glass slide and 3M elastomer as the encapsulating layer.

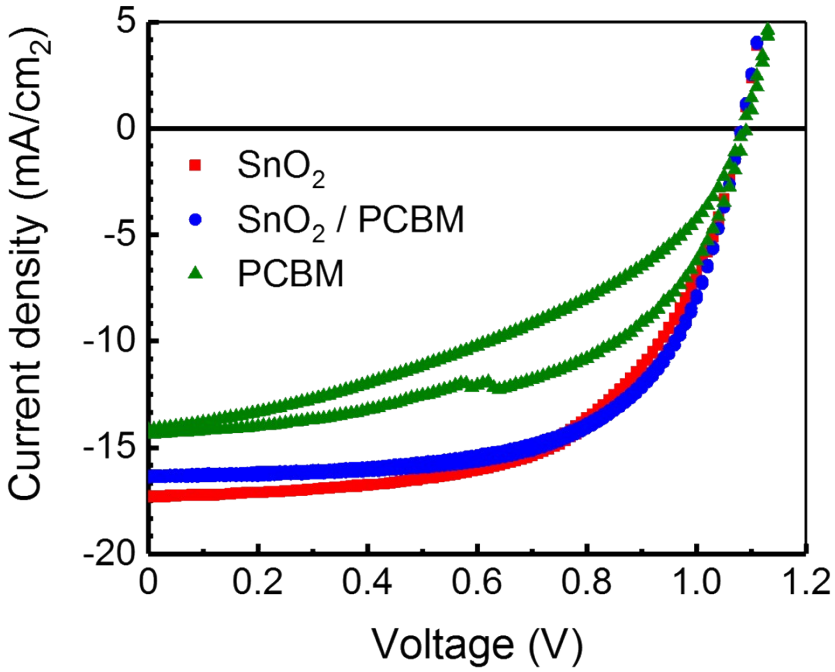


**Figure S3.** The *J-V* curves of the studied glass-based PVSCs using neat electrodeposited $SnO_2$ ETL, $SnO_2$/PCBM ETL, and PCBM ETL.

**Table S1.** Device parameters of the studied glass-based PVSCs using neat electrodeposited $SnO_2$ ETL, $SnO_2$/PCBM ETL, and PCBM ETL.

| Electron-transporting layer | | $V_{OC}$ (V) | $J_{SC}$ (mA/cm$^2$) | FF | PCE (%) |
|---|---|---|---|---|---|
| **$SnO_2$**[a)] | **F** | 1.08 | -17.27 | 0.60 | 14.0 |
| | **R** | 1.08 | -17.31 | 0.58 | 13.6 |
| **$SnO_2$ / PCBM** | **F** | 1.08 | -16.26 | 0.63 | 13.9 |
| | **R** | 1.08 | -16.37 | 0.63 | 14.0 |
| **PCBM** | **F** | 1.08 | -14.17 | 0.42 | 8.1 |
| | **R** | 1.09 | -14.37 | 0.55 | 10.8 |

* Measured under 0.8 sun illumination

* F: Forward-bias sweep (-0.1V→1.2V); R: Reverse-bias sweep (1.2V→-0.1V)

[a)] Time of electrodeposition for $SnO_2$: 60s

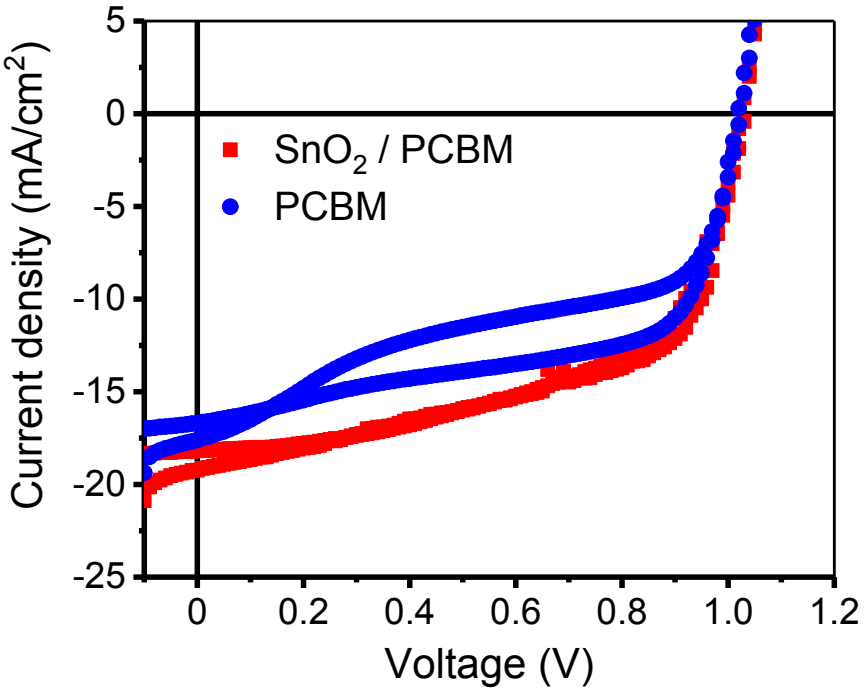


**Figure S4**. The J-V curves of the studied flexible PVSCs using a simplex PCBM ETL and the composite $SnO_2$/PCBM ETL at AM 1.5G illumination.

**Table S2.** Device parameters of the studied flexible PVSCs using a simplex PCBM ETL and the composite $SnO_2$/PCBM ETL at AM 1.5G illumination*.

| **Electron-transporting layer** | | **$V_{OC}$ (V)** | **$J_{SC}$ (mA/cm$^2$)** | **FF** | **PCE (%)** |
|---|---|---|---|---|---|
| **$SnO_2$ / PCBM** | **F** | 1.03 | -19.23 | 0.56 | 11.1 |
| | **R** | 1.02 | -18.19 | 0.58 | 10.7 |
| **PCBM** | **F** | 1.03 | -17.60 | 0.45 | 8.2 |
| | **R** | 1.02 | -16.69 | 0.60 | 10.2 |

* Measured under 1.0 sun illumination

* F: Forward-bias sweep (-0.1V→1.2V); R: Reverse-bias sweep (1.2V→-0.1V)

* Time of electrodeposition for $SnO_2$: 120s