Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Effect of processing temperature on film properties of ZnO by aqueous method and related organic photovoltaics and LEDs

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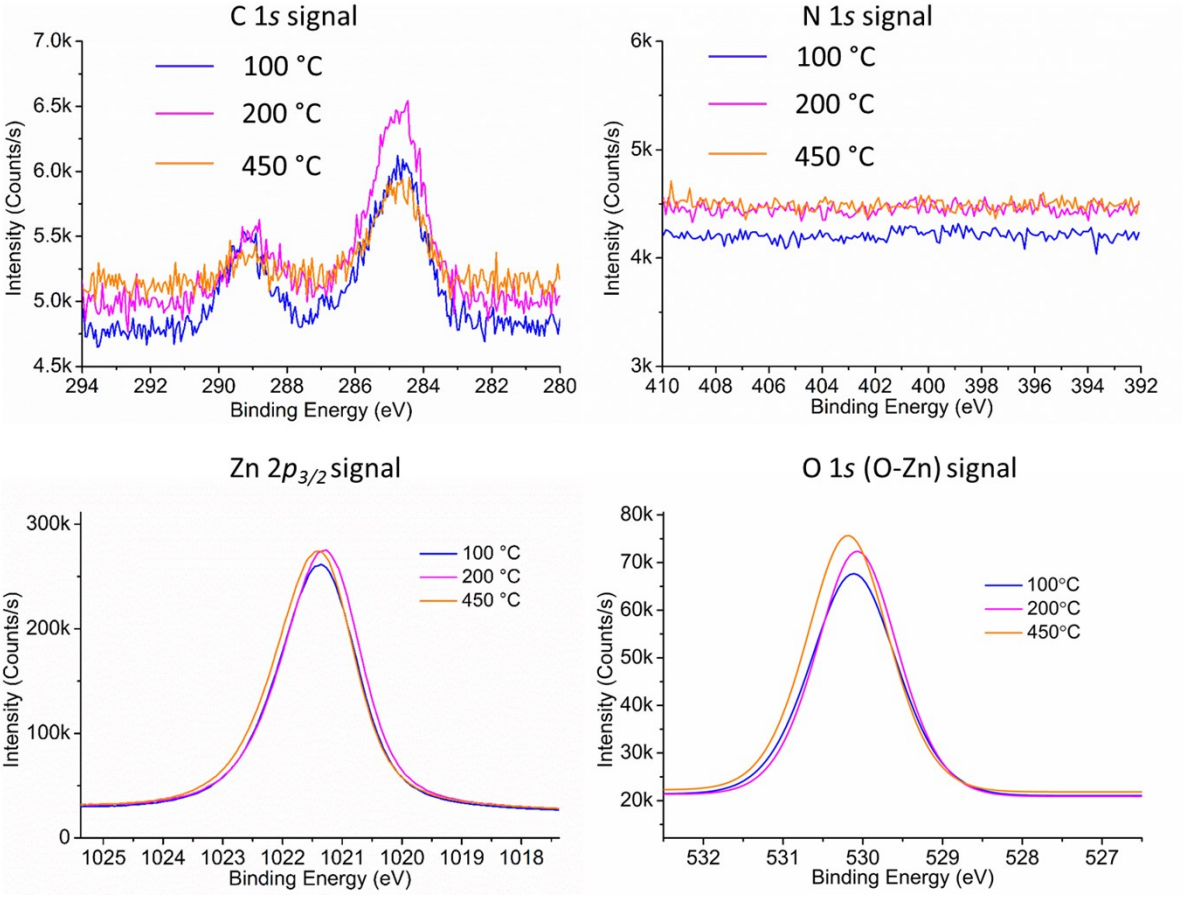
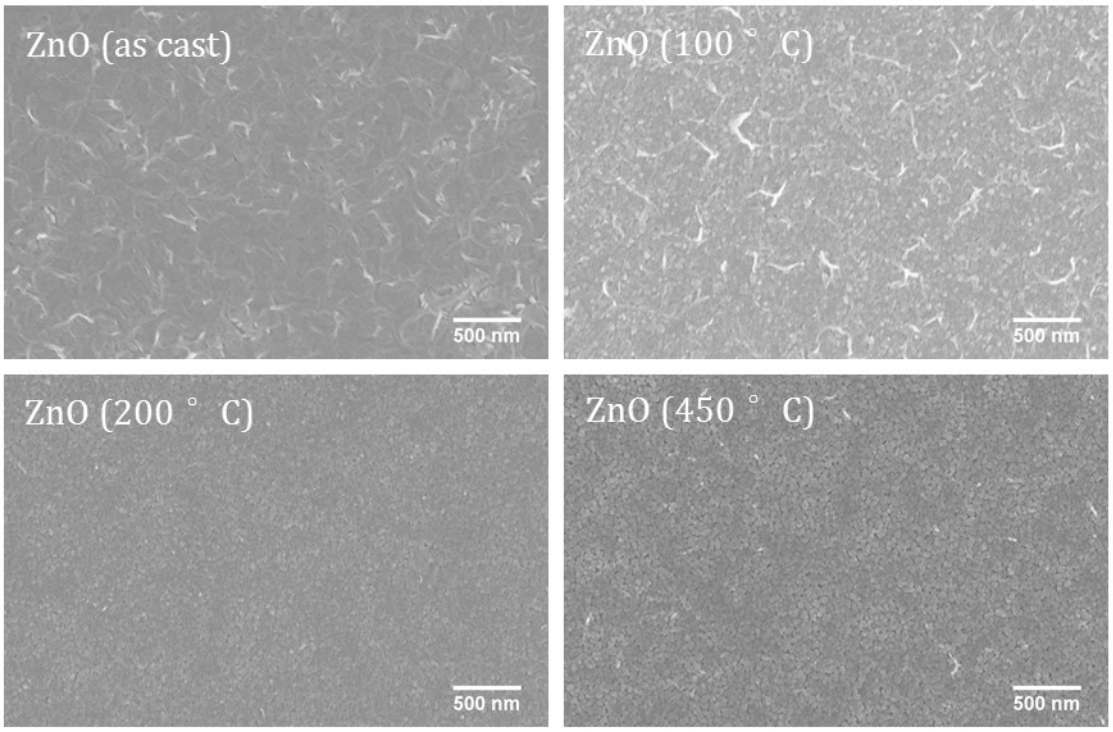
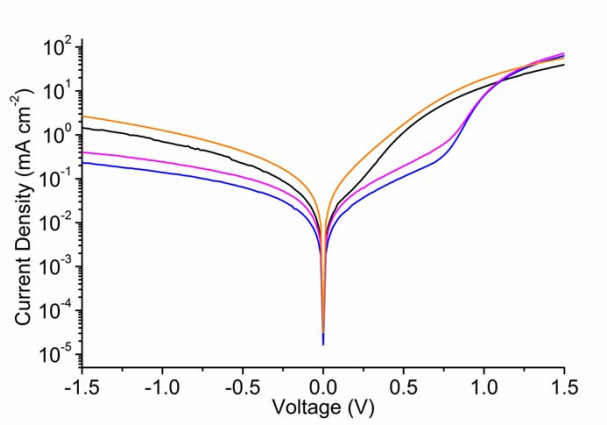


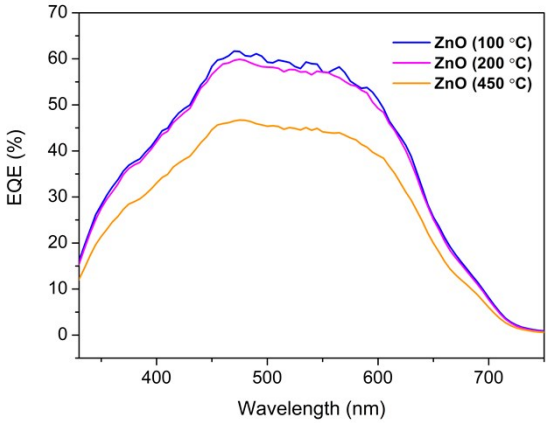
Supporting Figure 1 XPS spectra of ZnO with different processing temperatures: a) C 1*s* signal, used to align the B.E. positions of all spectra, b) N 1*s* signal, no nitrogen signal is detected even at 100 °C processed ZnO surface c) Zn 2p and d) O 1*s* (O-Zn), indicating the E_F shift with ZnO annealing temperatures.



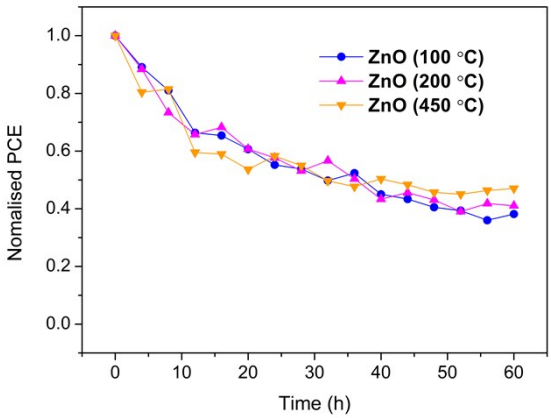
Supporting Figure 2 Large area SEM images of ZnO films showing fully covered and compact surface morphologies for films with all processing temperatures.



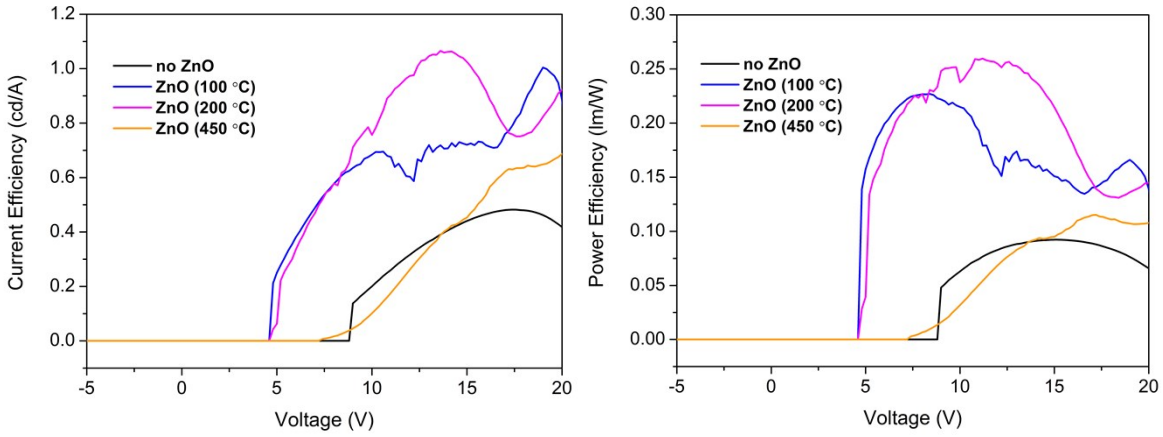
Supporting Figure 3 Representative dark J-V curves for devices prepared using ZnO electron transport layers (ETLs) deposited at the temperatures indicated.



Supporting Figure 4 The external quantum efficiency (EQE) spectra of OPVs with ZnO ETLs. Calculated J_{SC} values are 9.29, 9.05 and 7.1 mA/cm^2 for 100 °C, 200 °C and 450 °C annealed ZnO ETLs, respectively.



Supporting Figure 5 The stability of OPV devices under 1 sun illumination for 60 h, with ZnO ETLs annealed at different temperatures.



Supporting Figure 6 The current efficiency (left) and the power efficiency (right) spectra of OLEDs with ZnO ETLs.

Supporting Table 1 Performance metrics of OLED devices measured over the range of ETL processing temperatures.

Sample	Maximum current efficiency (Cd/A)	Voltage at maximum current efficiency (V)	Power efficiency at maximum current efficiency (Lm/W)	Luminance at maximum current efficiency (Cd/m^2)	Current density at maximum current efficiency (mA/cm^2)	Turn-on voltage (V)
No ZnO	0.45	17.8	0.08	470	105.21	6.4
ZnO (100 °C)	1.00	19.0	0.17	4160	414.00	2.6
ZnO (200 °C)	1.03	13.2	0.25	640	62.10	2.6
ZnO (450 °C)	0.67	21.4	0.10	2970	443.00	5.4