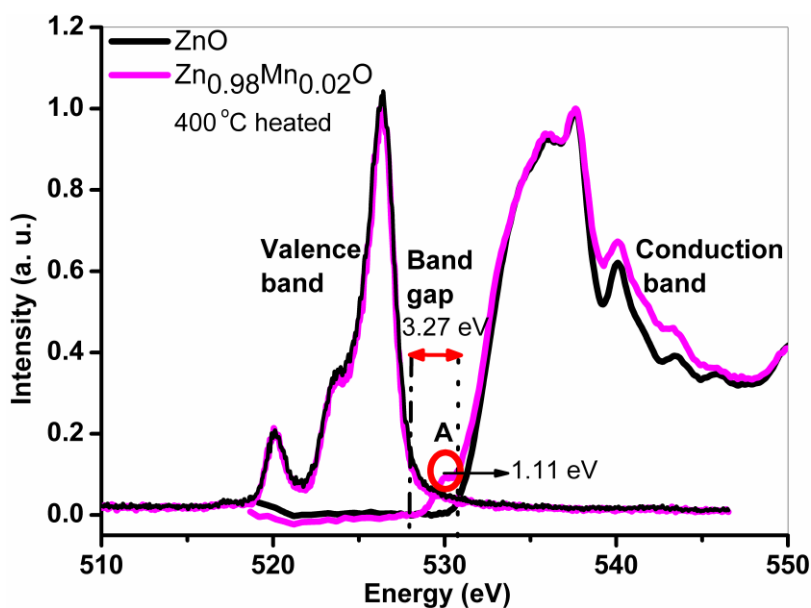


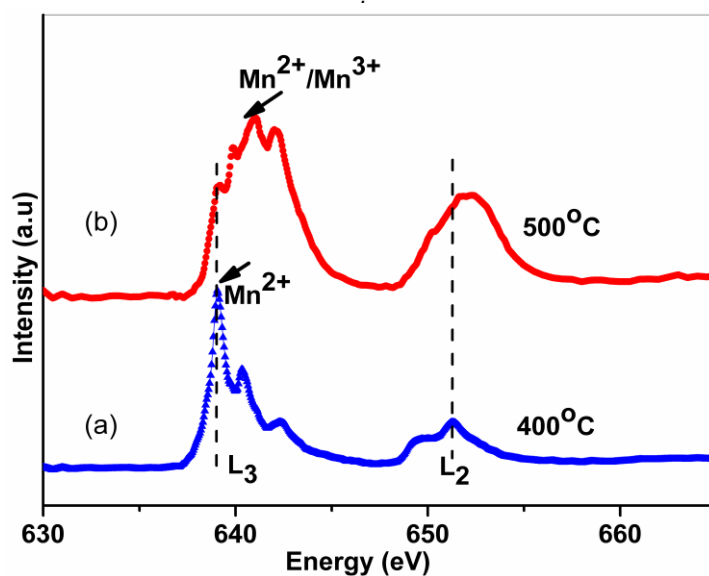
Piezoelectric inkjet printed films and patterns of ZnO and Mn doped ZnO: Formation of bifunctional $\text{Zn}_{0.98}\text{Mn}_{0.02}\text{O}$ films

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Electronic Supplementary information (ESI)



ESI Fig. S1. XAS and XES from the O K edge of 3 pass printed films of ZnO and $\text{Zn}_{0.98}\text{Mn}_{0.02}\text{O}$ after printing, drying and annealing at 400 °C for 30 minutes.



ESI Fig. S2. XAS of the transition metal Mn L edge of 3 pass printed film of $\text{Zn}_{0.98}\text{Mn}_{0.02}\text{O}$ after printing, drying and annealing at 400 °C and 500 °C for 30 minutes.

ESI -Table 1

Viscosity and surface tension of ZnO based ink as a function of precursor concentration, surfactant and binder.

Sr.No	Precursor concentration (M)	Surfactant (terpinol) wt. %	Binder wt. % (PVB)	Viscosity (cP)	Surface tension (dyne/cm)
1	0.1	0.05	0.005	4	20
2	0.15	0.05	0.005	5	23
3	0.2	0.05	0.005	7	25
4	0.25	0.05	0.005	9	28
5	0.25	0.05	0.008	9	32
6	0.25	0.05	0.01	10	35
7	0.25	0.1	0.01	12	35