Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C

Electronic Supplementary Information for

Metal Salt-Derived In-Ga-Zn-O Semiconductors Incorporating Formamide as Novel Co-solvent for Producing Solution-Processed, Electrohydrodynamic-Jet Printed, High Performance Oxide Transistors

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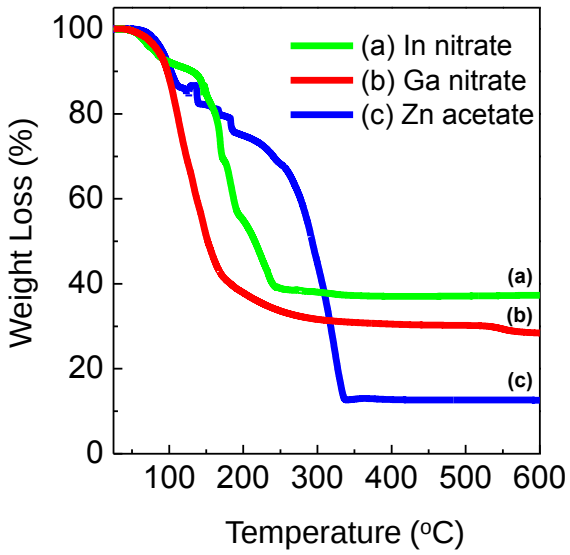

Fig. S1. TGA curves for precurosrs (In nitrate, Ga nitrate, and Zn acetate) used for syntheszing the IGZO solution.

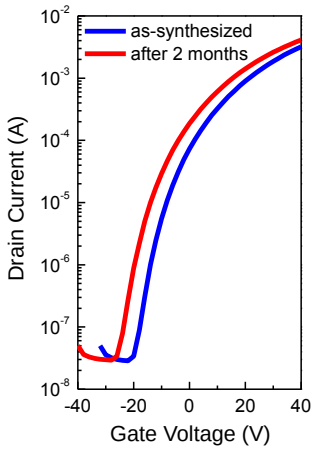

Fig. S2. The transfer characteristice for TFTs employing the IGZO channel layers prepared from as-synthesized and 2-months lasting precursor solution. Both precursor solutions included the FA of 50 vol%. The mobility and threshold voltage of IGZO TFT with channel layer prepared from 2-months lasting precursor solution were 9.9 $cm^2/V{\cdot}s$ and -8.9 V, respectively.

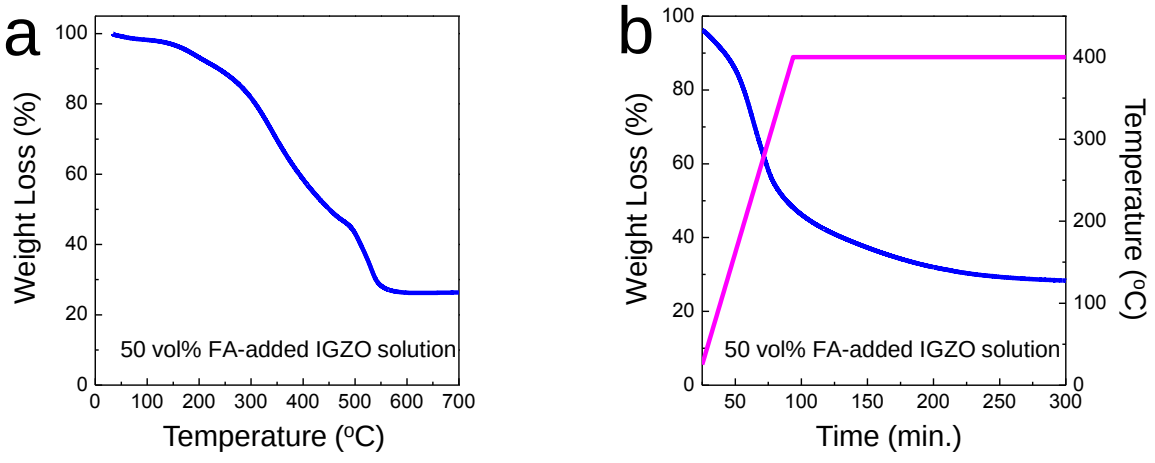

Fig. S3. (a) Temperature-dependent TGA curve and (b) time-dependent, isothermal TGA curve at 400 °C for 50 vol% FA-added IGZO precursor solution. The heating rate was 5 °C/min.

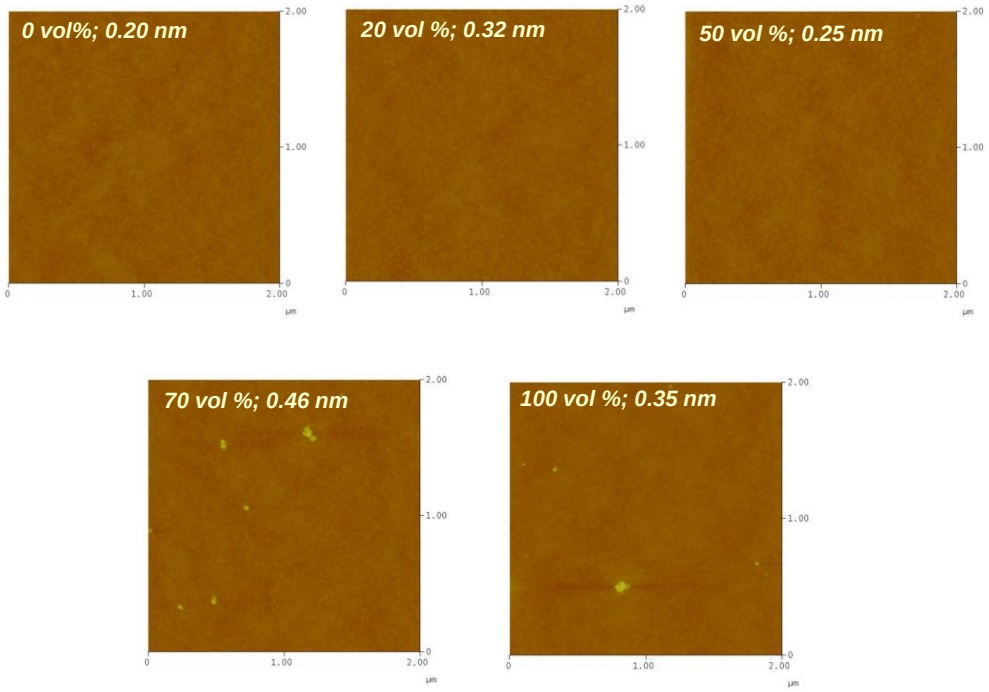

Fig. S4. Atomic force microscopy images for IGZO semiconductors derived from precursor solutions containing the different amount of FA between 0 and 100 vol%. The numbers indicate the value of r.m.s. roughness.

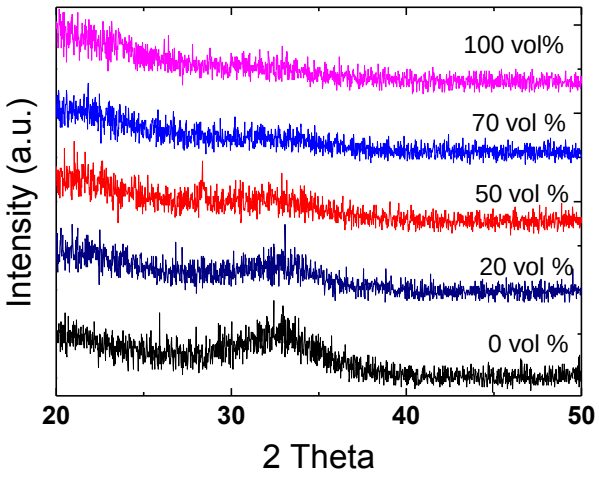

Fig. S5. X-ray diffraction results for IGZO semiconductors derived from precursor solutions containing the different amount of FA between 0 and 100 vol%.

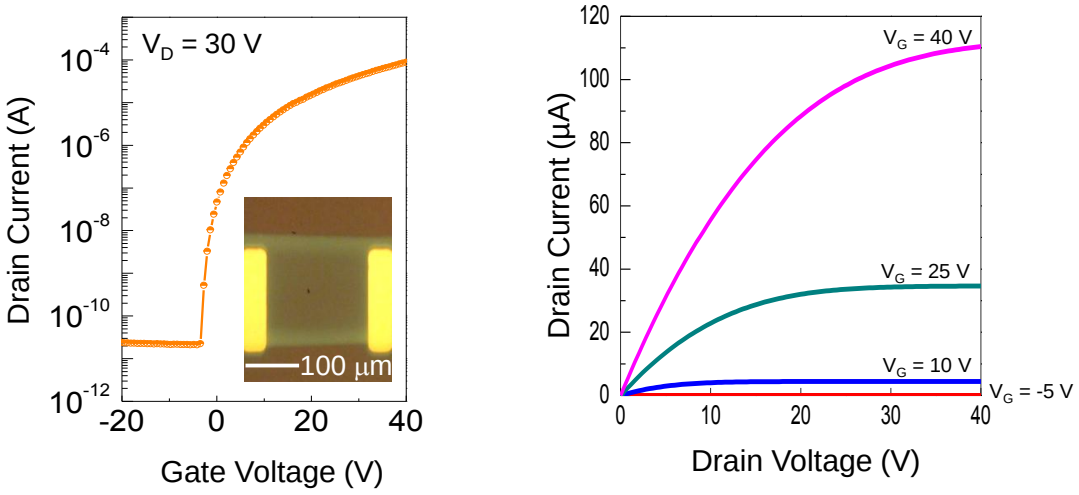

Fig. S6. Transfer and output characteristic for TFT employing e-jet printed IGZO channel layer, with a different channel geometry, that was formed by overlapping the lines. Inset is the optical microscopy image for a channel region. The 50 vol% FA-added IGZO precursor solution was used for e-jet printing.

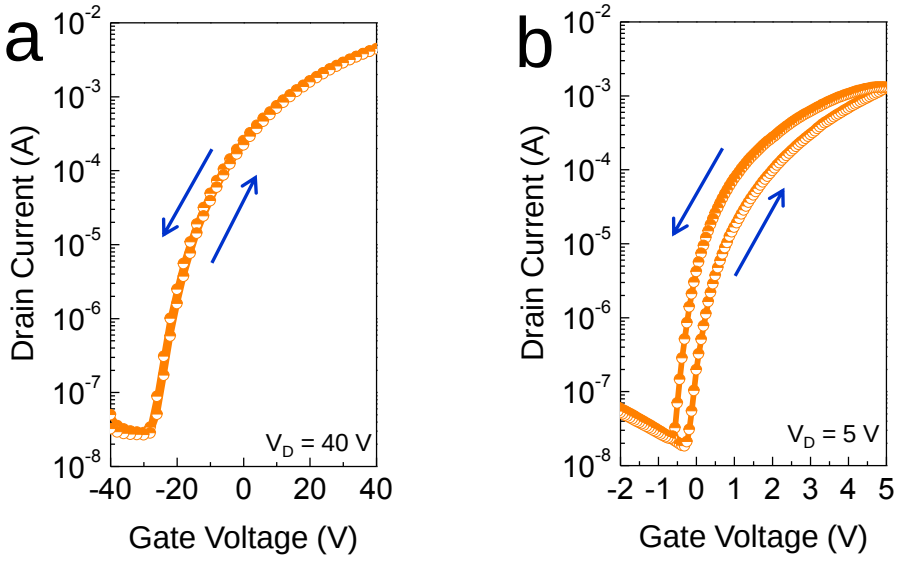

Fig. S7. The hysteresis behaviors for TFTs with (a) IGZO/SiO_2 and (b) IGZO/ZAO semiconductor/dielectric stack. The 50 vol% FA-added IGZO precursor solution was spin-coated as a channel layer.