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

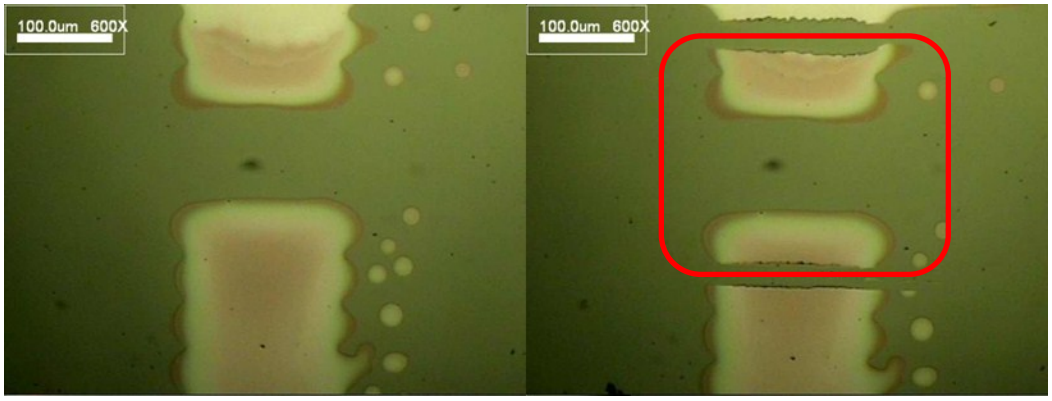


Fig. S1. Microscopic images of the fabricated SWCNT-TFT. The channel area of the TFT was mechanically patterned using a sharp tip. (left: before the patterning process, right: after the patterning process)

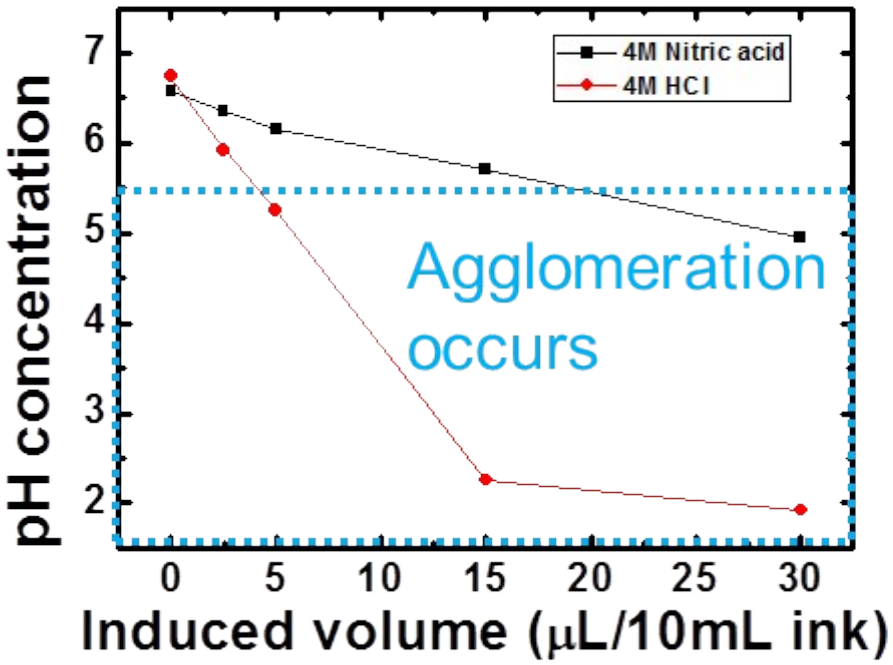
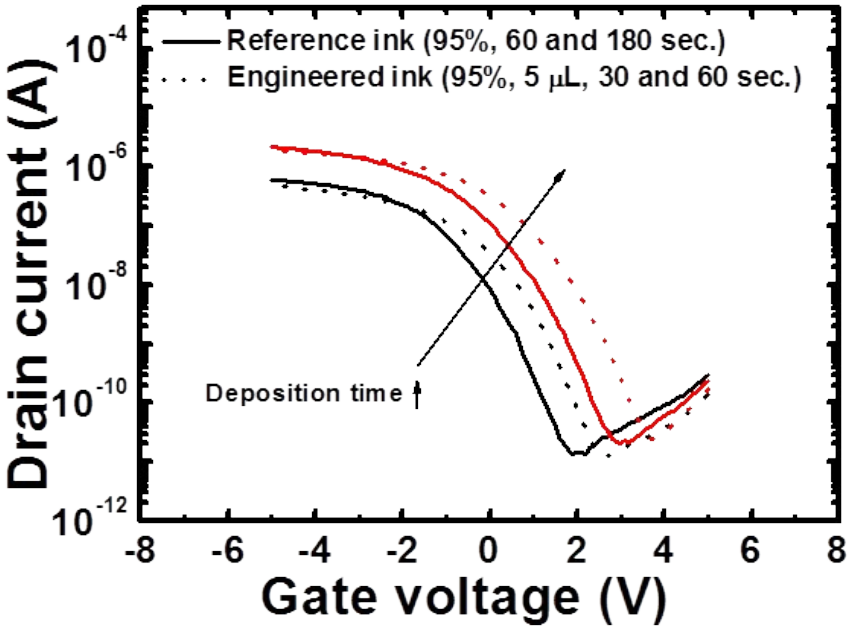


Fig. S2. pH concentration variations of the engineered inks as a function of induced acid volume in commercial SWCNT ink (10 mL). When pH concentration of the engineered ink is 5.0~5.5, large SWCNT agglomeration occurs.



Fig, S3 Transfer characteristics of the solution-processed SWCNT-TFTs fabricated by using the reference ink (95%-purified, deposition times of 60 and 180 seconds: solid line) and 4M nitric acid (5 μL)-added ink (95%-purified, deposition times of 30 and 60 seconds: dotted line)

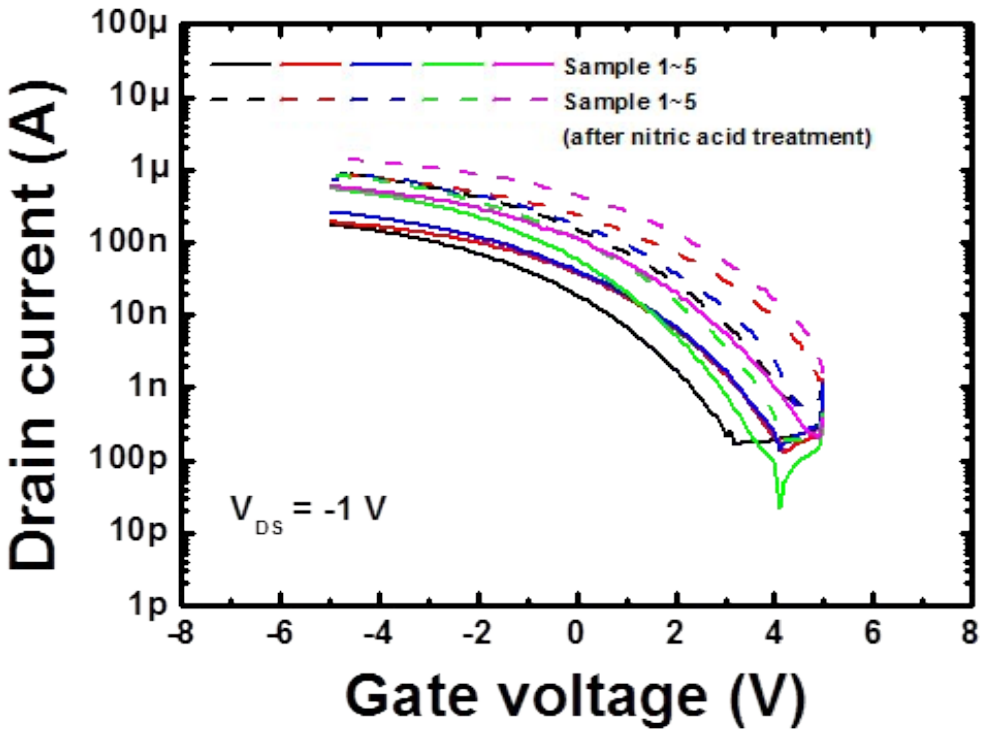


Fig. S4. The doping effect of nitric acid on the changes in the transfer characteristics of SWCNT-TFTs fabricated by using commercial ink. (Solid line: before post nitric acid treatment, dashed line: after post nitric acid treatment) For investigating doping effect of nitric acid, post acid treatment was employed. First, SWCNT-TFTs fabricated using commercial ink were measured, and then they were dipped into pH controlled water (pH: ~5.70, using nitric acid) for post acid treatment. After the dipping, substrate was blown by nitrogen gun, and then dried. After the drying(1 hour, 100 ℃), the SWCNT-TFTs were measured again.

Acid type	before / after	Mobility (cm^2/Vs)	Log_{10} (Ion/Ioff)	S.S.(V/dec)	V_{th}(V)
Nitric acid	before	3.00(±0.72)	3.47(±0.25)	1.29(±0.04)	0.29(±0.25)
	after	7.64(±0.59)	3.17(±0.14)	1.41(±0.15)	0.85(±0.36)

Table S1. Average electrical properties of the solution-processed SWCNT-TFTs for post nitric acid treatment.