***Wafer Preparation:*** A bottom-gate bottom-contact (BGBC) configuration was used for all of the OTFT devices. A heavily n+-doped SiO2/Si wafer with a 300 nm thick SiO2 dielectric layer was patterned with a gold source and drain pairs by conventional photolithography and thermal deposition techniques. The wafers were cleaned via oxygen plasma treatment with C18H37SH for 2 minutes, followed by sonication in acetone and iso-propanol. Subsequently, the wafers were treated with acid (aq.) and dodecyltrichlorosilane was deposited as a monolayer in toluene. The prepared wafers were dried on a hotplate at 120 °C for 30 minutes before spin-coating of the polymer films.

***Solution Preparation:***  Each of the compounds (*KG5-119, KG6-045C, KG6-049A, KG6-059B, NZ5-149*) was weighed on the bench-top (between 1-2 mg) in a clean 4 mL glass vial. The solvents were added to each compound to make a 6 mg/ mL solution in chloroform. *\*\*\*Note, spin-coating with 1% w/w polystyrene was attempted, however the devices did not work, so a standard fabrication protocol was used.\*\*\**

***Spin-Coating:*** Each of the compounds was spin-coated from the solutions at 2000 rpm for 60 s, forming uniform thin-films. No filtration was required. All devices were dried on a hotplate at 30 °C for 20 minutes (‘denoted “as-cast”, or RT) before being brought into the glove-box for testing. Devices were tested “as-cast”, and annealed at 50 °C, 100 °C, 150 °C, 200 °C and 250 °C for 20 minutes at each temperature, re-testing device parameters after each annealing cycle.

***Device Testing:*** Device testing was performed in the glovebox, in the dark, under an argon atmosphere using and Agilent B2912A source/measure unit. All the OTFT devices have a channel length (L) of 33 µm and a channel width (W) of 1000 µm. Five devices were tested per substrate, allowing for the calculation of an “average” and “best” mobility for each compound. The reported values for the “best” devices in the table display parameters for the device with the highest mobility. The average values listed are simply the mean average of the device parameters, with the standard deviation shown.

**Table 1:** n-type Device Parameters.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SAMPLE** | **ANNEALING** | **µE [CM2V-1s-1](best)** | **µE [cm2V-1s-1 ] (avg)** | **Ion/Ioff**  **(best)** | **Ion/Ioff (avg)** | **Vth [V] (best)** | **Vth [V] (avg)** |
| **KG5-**  **119** | **RT** | 0.00623 | 0.0015877±  0.0026127 | 10000 | 26200 | 60.74453 | 169.912399±  266.2479482 |
| **50 °C, 20 min** | 0.003829 | 0.0015116±  0.0013236 | 10000 | 10000 | 52.02428 | 46.4605933±  3.3741103 |
| **100 °C, 20 min** | 0.003218 | 0.0012455±  0.0011269 | 10000 | 10000 | 50.09279 | 45.502718±  3.5055072 |
| **150 °C, 20 min** | 0.000628 | 0.0003957±  0.0001951 | 1000 | 2800 | 42.0794 | 37.1457373±  7.7190604 |
| **200 °C, 20 min** | 0.000422 | 0.0002994±  8.3e-05 | 1000 | 4600 | 43.86911 | 41.0524398±  2.8130324 |
| **KG6-045C** | **RT** | 0.011693 | 0.0038326±  0.0045696 | 100000 | 26200 | 64.19728 | 64.3073483±  26.1136016 |
| **50 °C, 20 min** | 0.014979 | 0.0059255±  0.0053717 | 100000 | 46000 | 57.66448 | 49.5115099±  7.7703897 |
| **100 °C, 20 min** | 0.006485 | 0.0047065±  0.0013867 | 1000 | 20800 | 45.13372 | 44.4974982±  1.8736601 |
| **150 °C, 20 min** | 0.006279 | 0.0041491±  0.0018805 | 1000 | 1000 | 38.44849 | 38.2935771±  1.5591819 |
| **200 °C, 20 min** | 0.004265 | 0.0030132±  0.0012064 | 100 | 2620 | 36.55161 | 38.6010559±  5.1562046 |
| **KG6-049A** | **RT** | 0.003126 | 0.0011116±  0.0012313 | 10000 | 26200 | 45.3482 | 38.7124645±  23.8587095 |
| **50 °C, 20 min** | 0.001598 | 0.0011225±  0.0005665 | 10000 | 28000 | 37.80389 | 85.270258±  96.4612005 |
| **100 °C, 20 min** | 0.012941 | 0.0070787±  0.0055001 | 10000 | 26200 | 51.54036 | 42.8303766±  7.5175101 |
| **150 °C, 20 min** | 0.008883 | 0.0051811±  0.003233 | 1000 | 6400 | 36.17803 | 38.7711883±  2.3932396 |
| **200 °C, 20 min** | 0.004069 | 0.0028143±  0.0012739 | 1000 | 2800 | 47.2572 | 44.7464975±  4.1992466 |
| **KG6-059B** | **RT** | 0.000772 | 0.000435±  0.0002767 | 10000 | 8200 | 53.64241 | 36.3769263±  59.8756945 |
| **50 °C, 20 min** | 0.001931 | 0.0012732±  0.0005995 | 10000 | 8200 | 43.05494 | 43.0956495±  9.334671 |
| **100 °C, 20 min** | 0.00631 | 0.0036327±  0.0017961 | 10000 | 32500 | 54.66067 | 49.9450982±  3.2525707 |
| **150 °C, 20 min** | 0.002897 | 0.0021613±  0.0005207 | 1000 | 200800 | 44.35259 | 44.8367452±  1.1900281 |
| **200 °C, 20 min** | 0.001132 | 0.0007624±  0.0002389 | 100000 | 24400 | 41.74034 | 43.0222666±  1.2779045 |
| **NZ5-**  **149** | **RT** | 0.000111 | 4.45e-05± 4.48e-05 | 100 | 460 | 95.30991 | 100.9467746± 27.1782586 |
| **50 °C, 20 min** | 0.000251 | 5.83e-05± 0.0001081 | 1000 | 2440 | 57.87958 | 82.9825293± 65.5863881 |
| **100 °C, 20 min** | 0.000147 | 6.87e-05± 5.12e-05 | 100 | 100 | 62.01686 | 48.6117697± 17.2559243 |
| **150 °C, 20 min** | 3.78E-05 | 1.4e-05± 1.57e-05 | 1000 | 460 | 53.4244 | 18.3952275± 422.896114 |
| **200 °C, 20 min** | 0.000128 | 8.21e-05± 4.85e-05 | 1000 | 460 | 67.45604 | 63.1538183± 8.2679586 |

**Table 2:** p-type Device Parameters.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SAMPLE** | **ANNEALING** | **µE [CM2V-1s-1](best)** | **µE [cm2V-1s-1 ] (avg)** | **Ion/Ioff**  **(best)** | **Ion/Ioff (avg)** | **Vth [V] (best)** | **Vth [V] (avg)** |
| **KG5-**  **119** | **RT** | - | - | - | - | - | - |
| **50 °C, 20 min** | 0.000418 | 0.0001444±  0.0001643 | 10000 | 4600 | -20.5765 | 15.6735245±  3.595772 |
| **100 °C, 20 min** | 1.36E-05 | 1.03e-05±  2.6e-06 | 10000 | 2800 | -3.01398 | 0.7207227±  6.6605901 |
| **150 °C, 20 min** | 0.000467 | 9.98e-05±  0.0002052 | 10000 | 2440 | -31.2594 | 15.7015392±  15.1336387 |
| **200 °C, 20 min** | 6.38E-06 | 4.5e-06±  1.8e-06 | 10000 | 6040 | -7.38591 | 31.4917311±  55.2832329 |
| **KG6-045C** | **RT** | 0.000225 | 0.0001844±  4.87e-05 | 10000 | 46000 | -6.168 | -9.2036273±  2.9484373 |
| **50 °C, 20 min** | 0.000174 | 0.000156±  2.21e-05 | 10000 | 4600 | -8.93932 | -9.4917875±  4.7906169 |
| **100 °C, 20 min** | 9.05E-05 | 6.93e-05±  1.23e-05 | 10000 | 2080 | -11.0782 | 0.6708222±  7.4686915 |
| **150 °C, 20 min** | 4.55E-05 | 4.1e-05±  4.1e-06 | 100 | 262 | 1.019876 | -0.5831345±  5.5958968 |
| **200 °C, 20 min** | 4.01E-05 | 3.43e-05±  6e-06 | 100 | 2062 | -0.19251 | -1.7626755±  7.4677622 |
| **KG6-049A** | **RT** | 0.000285 | 0.0001768±  6.81e-05 | 10000 | 6400 | -6.36855 | 14.0386613±  4.3552991 |
| **50 °C, 20 min** | 0.000224 | 0.000164±  3.57e-05 | 100 | 4240 | -5.7645 | 14.7508933±  5.0629927 |
| **100 °C, 20 min** | 0.000135 | 0.0001136±  1.51e-05 | 1000 | 2440 | -0.71094 | -9.2997284±  5.7769326 |
| **150 °C, 20 min** | 8.77E-05 | 5.05e-05±  2.15e-05 | 100 | 460 | 2.057494 | 1.3743066±  5.1861773 |
| **200 °C, 20 min** | 5.77E-05 | 4.44e-05±  8.5e-06 | 100 | 100 | -32.4671 | 13.2281038±  11.9955304 |
| **KG6-059B** | **RT** | 0.000254 | 0.00021±  3.31E-05 | 100000 | 28000 | -25.4 | -20.1695±  3.966643 |
| **50 °C, 20 min** | 0.000277 | 0.00024±  2.52E-05 | 100000 | 64000 | -17.0872 | -19.9395±  2.881213 |
| **100 °C, 20 min** | - | - | - | - | - | - |
| **150 °C, 20 min** | 6.03E-05 | 4.60E-05±  1.02E-05 | 100000 | 42400 | 6.192284 | 6.509576±  4.396669 |
| **200 °C, 20 min** | 4.07E-05 | 2.39E-05±  1.01E-05 | 10000 | 4420 | -10.7294 | 0.615226±  6.459517 |
| **NZ5-**  **149** | **RT** | 0.006348 | 0.0020672± 0.0024131 | 10000 | 28000 | -52.5167 | -40.228194± 11.1866681 |
| **50 °C, 20 min** | 0.005953 | 0.0023231± 0.0024204 | 100000 | 55000 | -54.6187 | -42.1364582± 10.2363986 |
| **100 °C, 20 min** | 0.00386 | 0.0034026± 0.0004759 | 10000 | 28000 | -39.2151 | -41.7403495± 5.9173918 |
| **150 °C, 20 min** | 0.004182 | 0.0034618± 0.0006545 | 10000 | 28000 | -50.5755 | -43.048735± 5.2890989 |
| **200 °C, 20 min** | 0.001543 | 0.0012471± 0.0002637 | 10000 | 28000 | -38.0956 | -42.8138993± 5.524567 |