Supporting Information for

Thermostable Ion Gels for High-Temperature Operation of Electrolyte-Gated Transistors

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Figure S1. TGA data of PA6 ion gels containing polymer fractions of 10–50 wt%.

Figure S2. Specific capacitance and ionic conductivity of PA6 ion gels containing polymer fractions of 10–50 wt%. Capacitance data were obtained from the imaginary impedance at 1 Hz and the ionic conductivity values were calculated from the high frequency plateau of the real part impedance.
**Figure S3.** Elastic modulus versus ionic conductivity of 20 wt% PA gels; results for previously reported ion gels having inorganic, chemical, physical, and double networks are shown for comparison.

**Figure S4.** $I_D$ versus $V_G$ characteristics of P3HT EGTs using the 10 wt% PA6 gel dielectric in the saturation regime.
Figure S5 a) Quasi-static $I_D$ versus $V_G$ characteristics in the linear regime of 10 wt% PA 6 gel-gated EGTs and b) the corresponding changes in P3HT mobility over a period of 10 days.

Figure S6. Representative $I_D$ versus $V_G$ transfer characteristics in the (a, d) linear and (b, e) saturation regimes. (c, f) Representative $I_D$–$V_D$ output characteristics of the P3HT EGTs using PA6/6 and 6/12 gels as a gate dielectric layer.
Figure S7. (a) On current, off current, and on/off ratio and (b) carrier mobility data for P3HT EGTs gated with PA6 ion gels containing different polymer fractions of 10–50 wt%.

Figure S8. Normalized mobility of P3HT semiconductor after annealing at 150 °C for different periods of time. 10 wt% PA6 gel and SWCNT gate electrode were applied after thermal annealing of the P3HT.