Supporting Information for: Correlation of viscoelastic properties with solvation of regioregular poly(3-decylthiophene) films

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Information provided: Temperature dependent voltammetric response for thin P3DT film; voltammetric response and corresponding raw acoustic admittance spectra as functions of E, T and ω; “shifted” shear moduli acquired under potentiostatic conditions (E = 0.55 V); “shifted” shear moduli acquired under potentiostatic conditions (E = 0.80 V); shift factor variations with temperature for storage and loss moduli (5 figures).
Fig. S1: Voltammetric i-E responses for a P3DT film (h_f = 0.14 µm) exposed to 0.1 M LiClO_4 / CH_3CN as a function of temperature (as annotated). Scan rate, v = 10 mV s\(^{-1}\).
Fig. S2a

T=20°C

$E / V (Ag^+/Ag)$

$I / \mu A \text{ cm}^{-2}$

$T=20^\circ C$
Fig. S2b

E=0V

$\text{Re}(Y) / \text{mS}$

$\text{f} / \text{MHz}$
Fig. S2c

![Graph showing the relationship between real part of admittance (Re(Y)) and frequency (f) at different temperatures. The graph contains curves for 10°C, 20°C, 40°C, and 70°C. The voltage is set at 0.8V.](image)
Fig. S2: Overview of crystal admittance spectral variations with E, T and ω. Panel a: i-E response in 0.1 M LiClO₄ / CH₃CN. Panel b: admittance spectra at f = 10 MHz and E = 0.0 V as a function of T (as indicated); Panel c: admittance spectra at f = 10 MHz and E = 0.80 V as a function of T (as indicated); Panel d: admittance spectra at E = 0.0 V and T = 293 K as a function of frequency (frequency normalized with harmonic number, N, as indicated). h₀ = 0.47 μm.
Fig. S3: Stress master relaxation plots of shear modulus components for the film of Fig. 2. Panel (a): $G'$; panel (b) $G''$ (both plotted in double logarithmic format). $E = 0.55$ V. Temperatures as annotated. “Shift” procedure as Fig. 3; see main text.
Fig. S4: Stress master relaxation plots of shear modulus components for the film of Fig. 2. Panel (a): $G'$; panel (b) $G''$ (both plotted in double logarithmic format). $E = 0.80 \text{ V}$. Temperatures as annotated. “Shift” procedure as Fig. 3; see main text.
Fig. S5. Temperature variation of shift factors for (a) $G'$ and (b) $G''$. 

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