SUPPORTING INFORMATION

A Novel Functional Polyurethane as Dielectric Layer for Organic Thin-Film Transistors

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Fig. S1 The $^1$H NMR spectrum and structure of 2,2-bis(hydroxymethyl)butyl cinnamate (DMSO, 500 MHz).

Fig. S2 The FT-IR spectrum of 2,2-bis(hydroxymethyl)butyl cinnamate.
The HMBC characterization: \(^1\)H NMR (500 MHz, DMSO) \(\delta\) 7.76 – 7.70 (m, 2H), 7.65 (d, J = 16.0 Hz, 1H), 7.46 – 7.40 (m, 3H), 6.64 (d, J = 16.1 Hz, 1H), 4.45 (t, J = 5.2 Hz, 2H), 4.02 (s, 2H), 3.40 – 3.30 (m, 4H), 1.34 (q, J = 7.5 Hz, 2H), 0.84 (t, J = 7.5 Hz, 3H). FT-IR (KBr, cm\(^{-1}\)): 3692–3110 (s, –OH), 2971 (w, –CH3), 2889 (w, –CH2–), 1697 (s, –C=O), 1637 (s, –C=C), 1454, 1381 (m, benzene).

\[\text{Fig. S3} \] The \(^1\)H NMR spectrum and structure of PU-1 (DMSO, 500 MHz).

The PU-1 characterization: \(^1\)H NMR (500 MHz, DMSO) \(\delta\) 8.12 (s, 1H), 8.07 (s, 14H), 8.03 (s, 1H), 7.65 (d, J = 16.2 Hz, 1H), 6.63 (d, J = 16.2 Hz, 1H), 3.44 (d, J = 35.4 Hz, 10H). FT-IR (KBr, cm\(^{-1}\)): 3714–3169 (s, –OH), 2929 (w, –CH3), 2852 (w, –CH2–), 1724 (s, –C=O), 2230 (m, –CN), 1637 (s, –C=C), 1454, 1373 (m, benzene).
Fig. S4 The FT-IR spectrum of PU-1.

Fig. S5 The $^1$H NMR spectrum and structure of PU-2 (DMSO, 500 MHz).
The PU-2 characterization: $^1$H NMR (500 MHz, DMSO) $\delta$ 8.12 (s, 2H), 8.08 (s, 12H), 8.02 (d, $J$ = 6.9 Hz, 2H), 7.65 (d, $J$ = 16.0 Hz, 1H), 6.63 (d, $J$ = 16.1 Hz, 1H), 3.47 (d, $J$ = 13.9 Hz, 10H). FT-IR (KBr, cm$^{-1}$): 3714–3169 (s, $\text{-OH}$), 2929 (w, $\text{-CH}_3$), 2852 (w, $\text{-CH}_2$–), 1724 (s, $\text{-C=O}$), 2230 (m, $\text{-CN}$), 1637 (s, $\text{-C=C}$), 1454, 1373 (m, benzene).

The PU-3 characterization: $^1$H NMR (500 MHz, DMSO) $\delta$ 8.11 (s, 4H), 8.08 (s, 8H), 8.03 (s, 4H), 7.65 (d, $J$ = 16.0 Hz, 1H), 6.63 (d, $J$ = 15.9 Hz, 1H), 3.45 (d, $J$ = 33.9 Hz, 10H). FT-IR (KBr, cm$^{-1}$): 3714–3169 (s, $\text{-OH}$), 2929 (w, $\text{-CH}_3$), 2852 (w, $\text{-CH}_2$–), 1724 (s, $\text{-C=O}$), 2230 (m, $\text{-CN}$), 1637 (s, $\text{-C=C}$), 1454, 1373 (m, benzene).
Fig. S7 The $^1$H NMR spectrum and structure of PU-3 (DMSO, 500 MHz).

Fig. S8 The FT-IR spectrum of PU-3.
Fig. S9 Capacitance–frequency curve for the dielectric film investigated in this study under 0 V bias voltages.