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Supporting Information

Ionic liquid crystals of quaternary ammonium salts with a 2-hydroxypropoxy insertion group

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^{1}H NMR spectrum and elemental microanalyses for all compounds

R_{12}HTABr: ^{1}H NMR: δ 0.85 (3 H, t, *CH_3* aliphatic chain); 1.23 (18 H, m, *CH_2* aliphatic chain); 1.50 (2 H, m, *CH_2* aliphatic chain); 3.39 (4 H, t, 2 O-*CH_2*); 3.47 (9 H, s, 3 *CH_3*); 3.53 (1 H, m, N-CH_2-*CH*); 3.58 (2 H, d, N-*CH_2*); 4.48 (1 H, br s, *OH*). Calc. (%) for $C_{18}H_{40}NO_2Br$: C, 56.48; H, 10.46; N, 3.66. Found (%): C, 56.43; H, 10.50; N, 3.63.

R_{14}HTABr: ^{1}H NMR: δ 0.85 (3 H, t, *CH_3* aliphatic chain); 1.23 (22 H, m, *CH_2* aliphatic chain); 1.50 (2 H, m, *CH_2* aliphatic chain); 3.40 (4 H, t, 2 O-*CH_2*); 3.47 (9 H, s, 3 *CH_3*); 3.54 (1 H, m, N-CH_2-*CH*); 3.59 (2 H, d, N-*CH_2*); 4.49 (1 H, br s, *OH*). Calc.

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(%) for $C_{20}H_{44}NO_2Br$: C, 58.53; H, 10.81; N, 3.41. Found (%): C, 58.48; H, 10.82; N, 3.48.

R_{16}HTABr: ^{1}H NMR: δ 0.86 (3 H, t, *CH_3* aliphatic chain); 1.22 (26 H, m, *CH_2* aliphatic chain); 1.51 (2 H, m, *CH_2* aliphatic chain); 3.41 (4 H, t, 2 O-*CH_2*); 3.48 (9 H, s, 3 *CH_3*); 3.53 (1 H, m, N-CH_2-*CH*); 3.61 (2 H, d, N-*CH_2*); 4.52 (1 H, br s, *OH*). Calc. (%) for $C_{22}H_{48}NO_2Br$: C, 60.26; H, 11.03; N, 3.19. Found (%): C, 60.17; H, 10.97; N, 3.29.

R_{12}HTABF_4: ^{1}H NMR: δ 0.87 (3 H, t, *CH_3* aliphatic chain); 1.25 (18 H, m, *CH_2* aliphatic chain); 1.54 (2 H, m, *CH_2* aliphatic chain); 3.23 (9 H, s, 3 *CH_3*); 3.33 (4 H, t, 2 O-*CH_2*); 3.40 (1 H, m, N-CH_2-*CH*); 3.46 (2 H, d, N-*CH_2*); 4.32 (1 H, br s, *OH*). Calc. (%) for $C_{18}H_{40}NO_2BF_4$: C, 55.55; H, 10.28; N, 3.60. Found (%): C, 55.53; H, 10.21; N, 3.66.

R_{14}HTABF_4: ^{1}H NMR: δ 0.88 (3 H, t, *CH_3* aliphatic chain); 1.25 (22 H, m, *CH_2* aliphatic chain); 1.53 (2 H, m, *CH_2* aliphatic chain); 3.25 (9 H, s, 3 *CH_3*); 3.35 (4 H, t, 2 O-*CH_2*); 3.42 (1 H, m, N-CH_2-*CH*); 3.46 (2 H, d, N-*CH_2*); 4.34 (1 H, br s, *OH*). Calc. (%) for $C_{20}H_{44}NO_2BF_4$: C, 57.58; H, 10.63; N, 3.35. Found (%): C, 57.53; H, 10.59; N, 3.55.

R_{16}HTABF_4: ^{1}H NMR: δ 0.87 (3 H, t, *CH_3* aliphatic chain); 1.24 (26 H, m, *CH_2* aliphatic chain); 1.54 (2 H, m, *CH_2* aliphatic chain); 3.28 (9 H, s, 3 *CH_3*); 3.37 (4 H, t, 2 O-*CH_2*); 3.43 (1 H, m, N-CH_2-*CH*); 3.48 (2 H, d, N-*CH_2*); 4.35 (1 H, br s, *OH*). Calc. (%) for $C_{22}H_{48}NO_2BF_4$: C, 59.34; H, 10.86; N, 3.14. Found (%): C, 59.24; H, 10.85; N, 3.11.

Strain sweep tests of rheological measurements

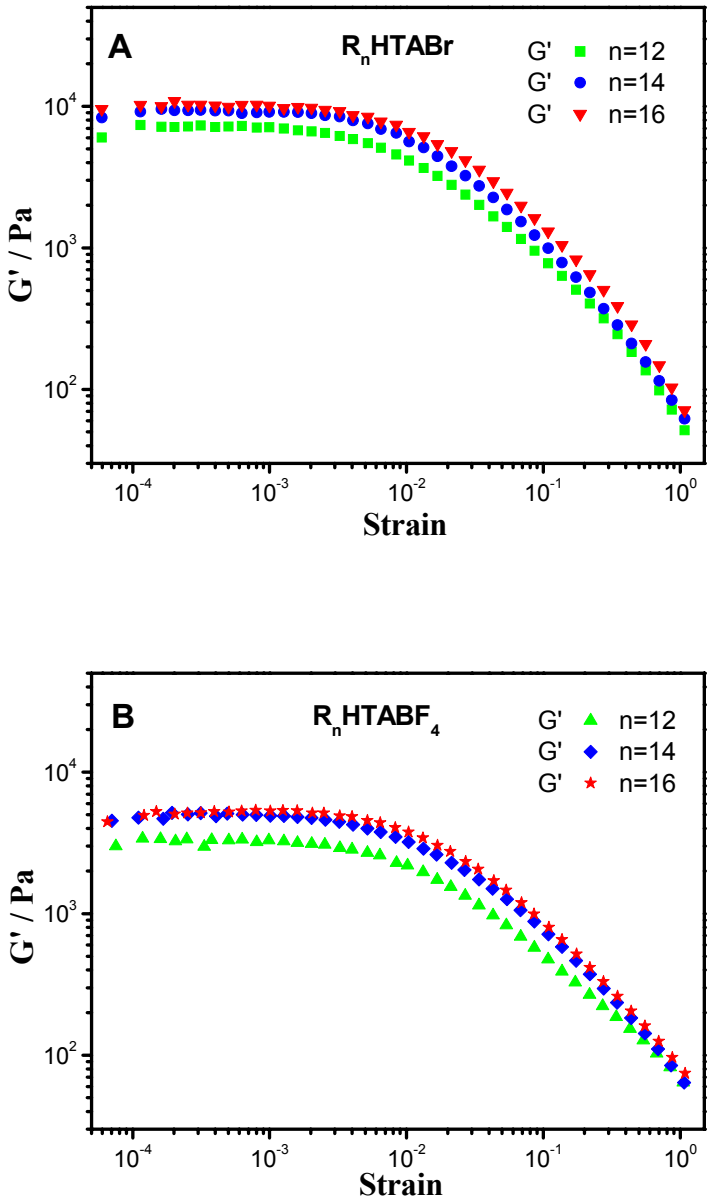

Fig. S1 Dynamic strain sweep tests of the smectic phases for (A) R_nHTABr (B) R_nHTABF_4 at 130 °C.