Supplementary Material

Key factors to prepare polyelectrolytes showing temperature-sensitive LCST-type phase transition in water

Yuki Kohno and Hiroyuki Ohno*

*Department of Biotechnology, Tokyo University of Agriculture and Technology,
2-24-16, Naka-cho, Koganei, Tokyo 184-8588, Japan

*Corresponding Author: ohnoh@cc.tuat.ac.jp
Characterization of ILs

[P₄₄₄₄][SS]: \(^1\)H NMR (400MHz, CDCl\(_{3}\), \(\delta/\text{ppm relative to TMS}\)): 0.92(t, \(J \ 6.4\), 12H), 1.43-1.44(m, 16H), 2.2(m, 8H), 5.2(d, \(J \ 10.5\), 1H), 5.7(d, \(J \ 17.4\), 1H), 6.7(q, \(J \ 28.4\), 1H), 7.3(d, \(J \ 6.4\), 2H), 7.8(t, \(J \ 7.8\), 2H).

[P₄₄₄₆][SS]: \(^1\)H NMR (400MHz, CDCl\(_{3}\), \(\delta/\text{ppm relative to TMS}\)): 0.85-0.93(m, 12H), 0.93-1.46(m, 20H), 2.18-2.23(m, 8H), 5.23(d, \(J \ 11.9\), 1H), 5.72(d, \(J \ 18.3\), 1H), 6.68(q, \(J \ 28.4\), 1H), 7.34(d, \(J \ 7.8\), 2H), 7.83(d, \(J \ 6.8\), 2H).
Phase separation temperature of $[\text{P}_{4444}][\text{SS}]$/water mixture

Fig. S1. Phase separation temperature of $[\text{P}_{4444}][\text{SS}]$ after mixing with different amount of water.
Fig. S2. ATR-FTIR spectra of [P₄₄₄₄][SS] (dotted line), and poly([P₄₄₄₄][SS]) (solid line).
Fig. S3. ATR-FTIR spectra of [P_{4446}][SS] (dotted line), and poly([P_{4446}][SS]) (solid line).
Fig. S4. ATR-FTIR spectra of poly([P₄₄₄₄][SS]₀.₇-co-[P₄₄₄₆][SS]₀.₃).
$^1$H NMR spectra of [P$_{4444}$][SS] and their polymers

**Fig. S5.** $^1$H NMR spectra of [P$_{4444}$][SS] (black line), and poly([P$_{4444}$][SS]) (red line).
Fig. S6. $^1$H NMR spectra of $[P_{4446}][SS]$ (black line), and poly($[P_{4446}][SS]$) (red line).
Fig. S7. $^1$H NMR spectra of poly([P$_{4444}$][SS]$_{0.7}$-co-[P$_{446}$][SS]$_{0.3}$).