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Supporting Information for:

A highly anisotropic and hydrolytically degradable Pickering emulsifier for oil-in-water emulsions

J. J. S. Tyler, M. A. H. Farmer, O. O. Mykhaylyk, M. J. Orchard, O. M. Musa
and S. P. Armes^a

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Table S1. Volume-average droplet diameter, $D[4,3]$, and associated span (which is a measure of the width of the droplet size distribution such that $\text{span} = \frac{D(90)-D(10)}{D(50)}$) for Pickering emulsions prepared at 20 °C via high-shear homogenization at 13,500 rpm for 2 min using 20% v/v squalane and an aqueous dispersion of PLLA₁₇-PDMAC₄₀₀ platelets at varying concentrations (0.001 to 1.0 % w/w).

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Table S2. Volume-average droplet diameter, $D[4,3]$, and associated span (which is a measure of the width of the droplet size distribution such that $\text{span} = \frac{D(90)-D(10)}{D(50)}$) for Pickering emulsions prepared at 20 °C via high-shear homogenization at 5,000 to 25,000 rpm for 2 min using a 0.025 % w/w aqueous dispersion of PLLA₁₇-PDMAC₄₀₀ platelets and 20% v/v squalane.

Figure S6. Laser diffraction particle size distribution recorded for a dilute aqueous dispersion of PLLA₁₇-PDMAC₄₀₀ platelets.

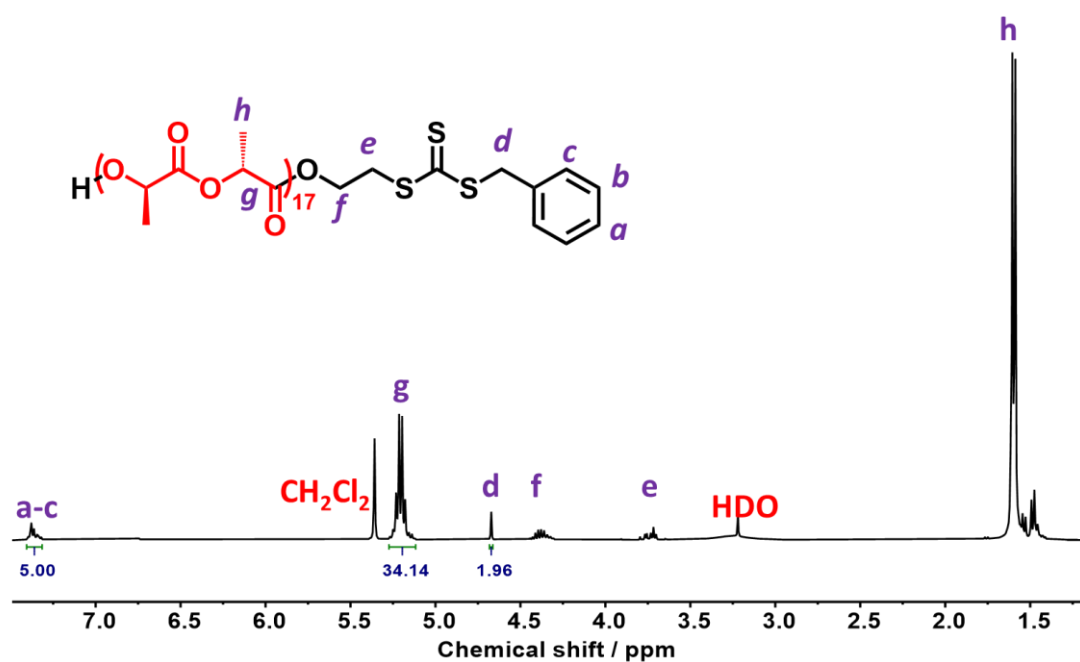


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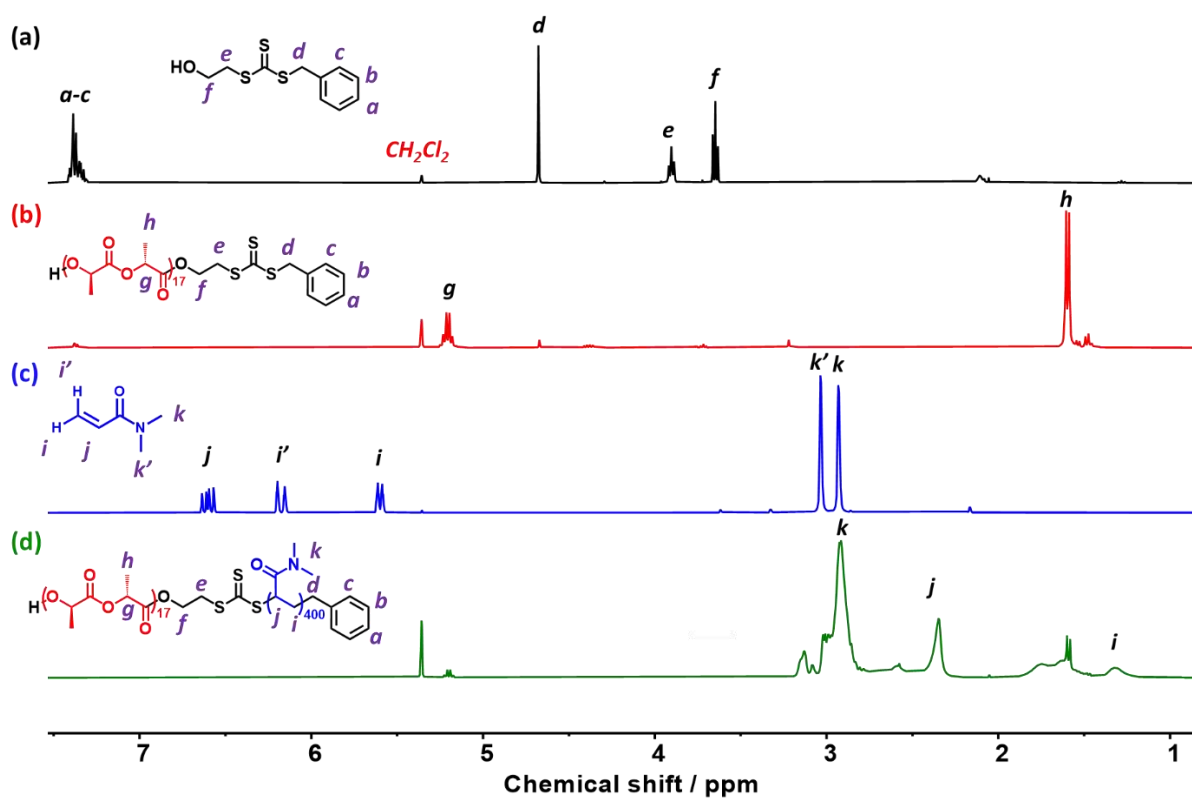


Figure S2. ¹H NMR spectra (CD₂Cl₂) recorded for (a) the hydroxy-functional RAFT agent, (b) the PLLA₁₇-TTC precursor, (c) DMAC monomer, and (d) the PLLA₁₇-PDMAC₄₀₀ diblock copolymer.

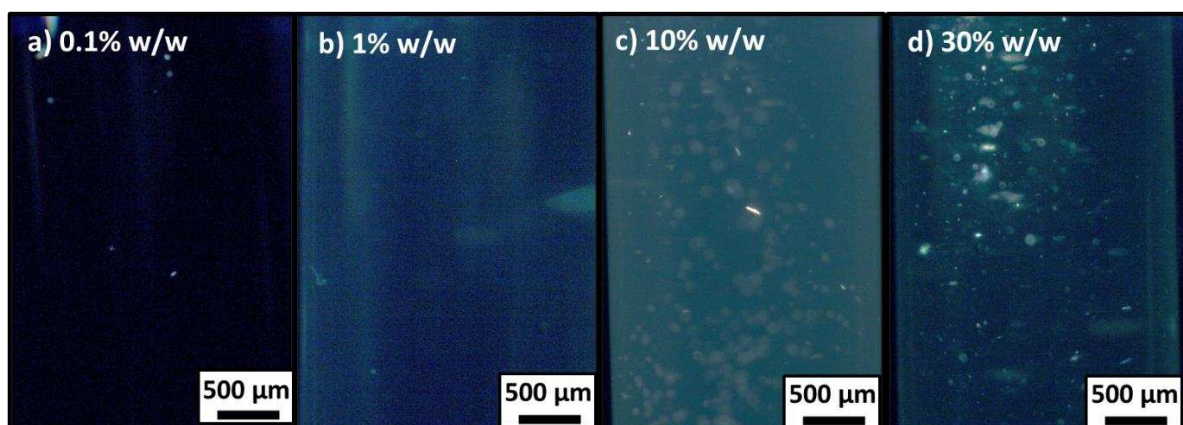


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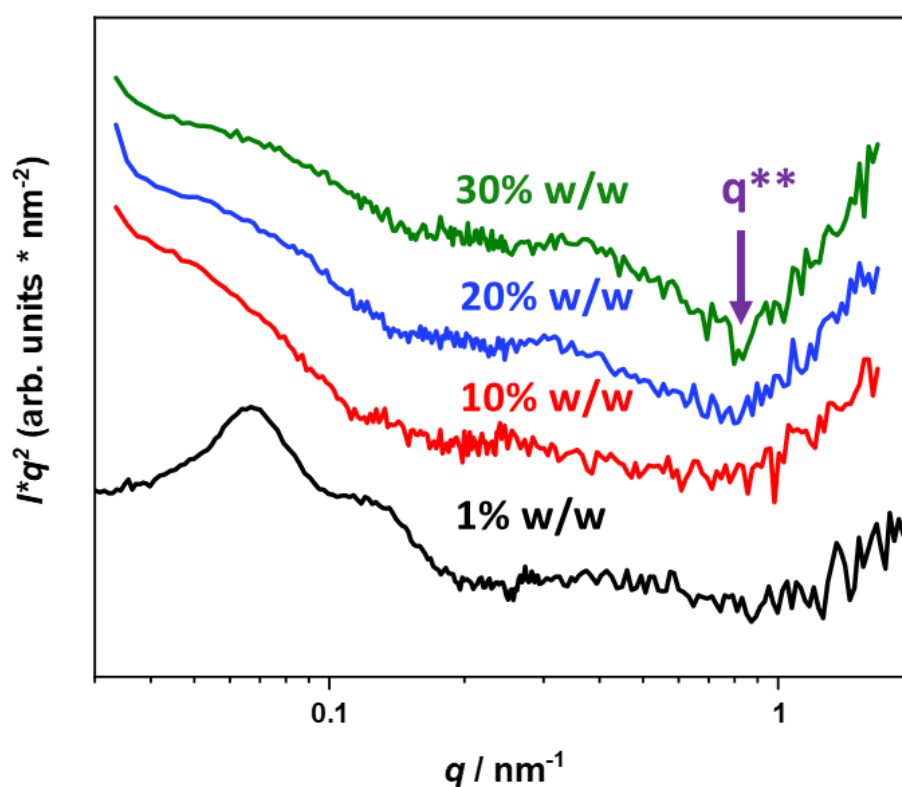


Figure S4. Kratky plots ($I \cdot q^2$ vs. q) recorded for four aqueous dispersions of PLLA₁₇-PDMAC₄₀₀ platelets at a copolymer concentration of 1%, 10%, 20% or 30 % w/w. The local minimum denoted by q^{**} can be used to estimate the mean platelet thickness.

PLLA ₁₇ -PDMAC ₄₀₀ concentration / % w/w	Volume-average droplet diameter, D[4,3] / μm	Span
0.0010	125	1.4
0.0050	85	1.1
0.010	67	0.77
0.025	43	0.75
0.030	41	1.0
0.050	40	1.2
0.080	43	1.2
0.10	40	1.1
1.0	42	1.1

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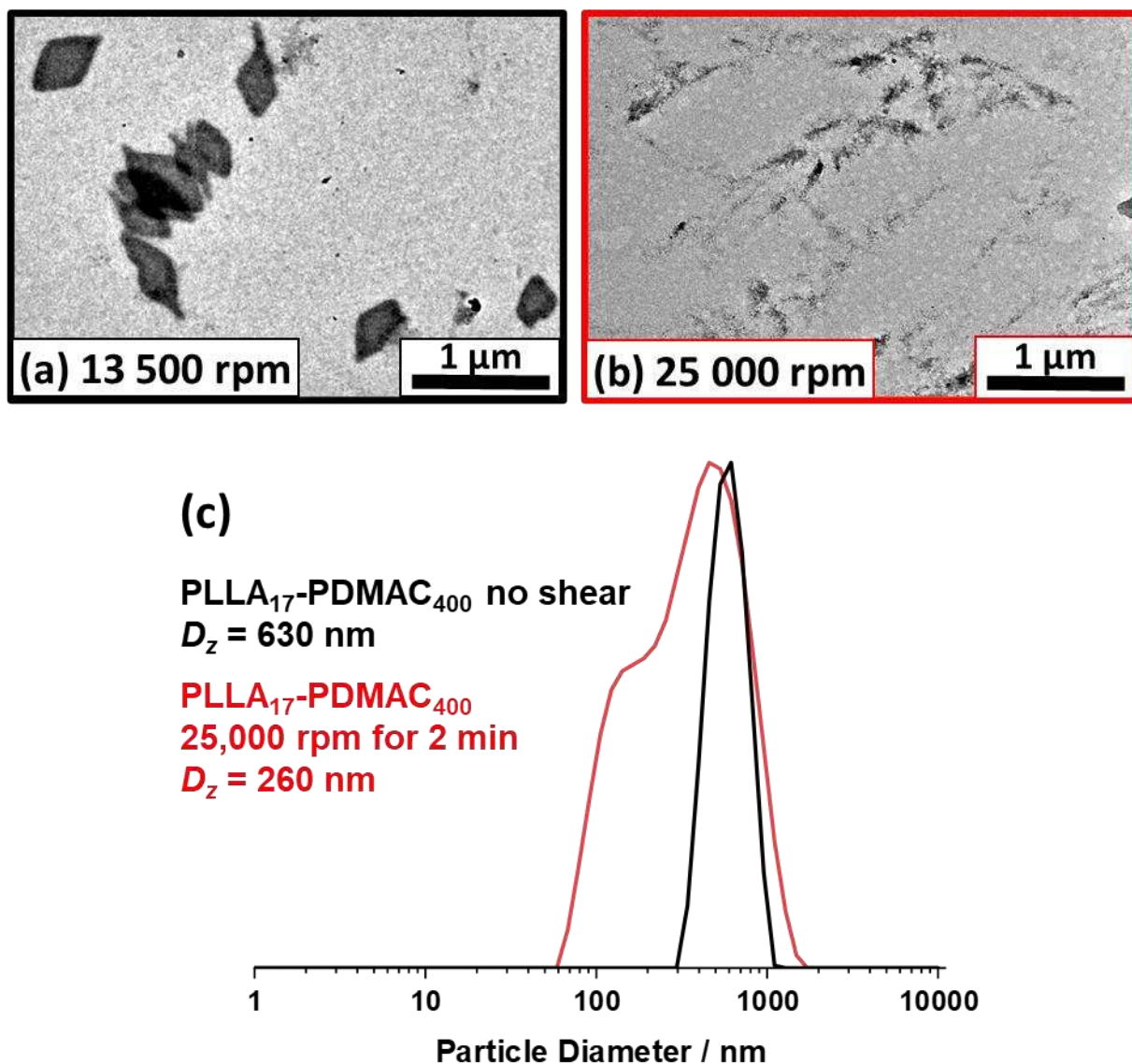


Figure S5. Representative TEM images recorded for a 0.025 % w/w aqueous dispersion of PLLA₁₇-PDMAC₄₀₀ platelets after being subjected to high-shear homogenization in the presence of 20% squalane by volume at (a) 13 500 rpm and (b) 25 000 rpm. (c) DLS particle size distributions (plus the corresponding sphere-equivalent z-average hydrodynamic radii) recorded for a 0.1% w/w PLLA₁₇-PDMAC₄₀₀ dispersion before and after being subjected to high-shear homogenization at 25 000 rpm.

Shear rate / rpm	Volume-average droplet diameter, D[4,3] / μm	Span
Hand shaken	175	0.81
5 000	140	0.60
7 500	99	0.73
10 000	68	0.83
13 500	43	0.75
15 000	45	0.83
20 000	42	1.0
22 500	42	0.89
25 000	29	0.79

Table S2. Volume-average droplet diameter, D[4,3], and associated span (which is a measure of the width of the droplet size distribution such that $\text{span} = \frac{D(90) - D(10)}{D(50)}$) for Pickering emulsions prepared at 20 °C via high-shear homogenization at 5,000 to 25,000 rpm for 2 min using a 0.025 % w/w aqueous dispersion of PLLA₁₇-PDMAC₄₀₀ platelets and 20% v/v squalane.

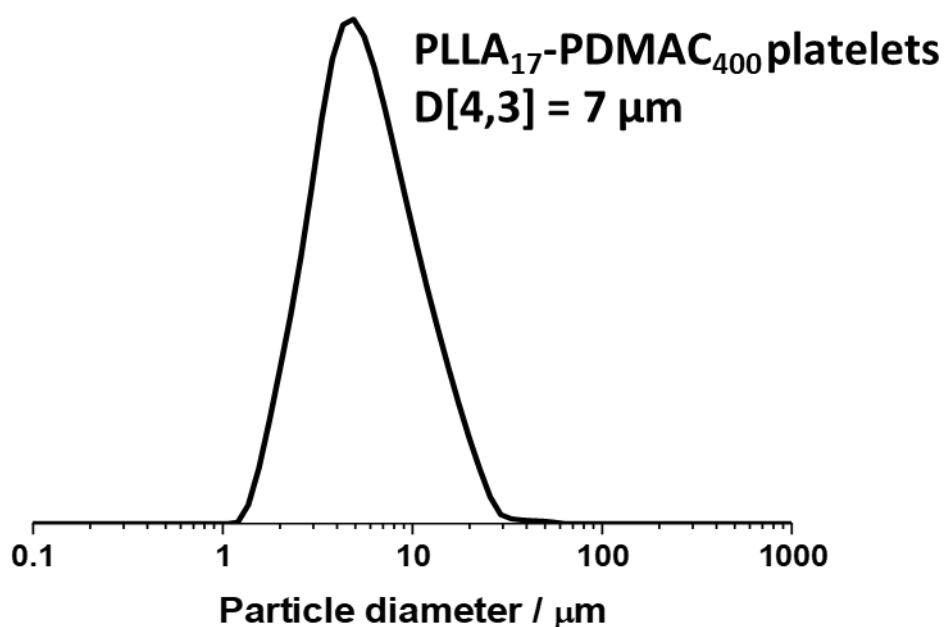


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