Supplementary information

Polymeric micelles using cholinium-based ionic liquids for the encapsulation and drug release of hydrophobic molecules

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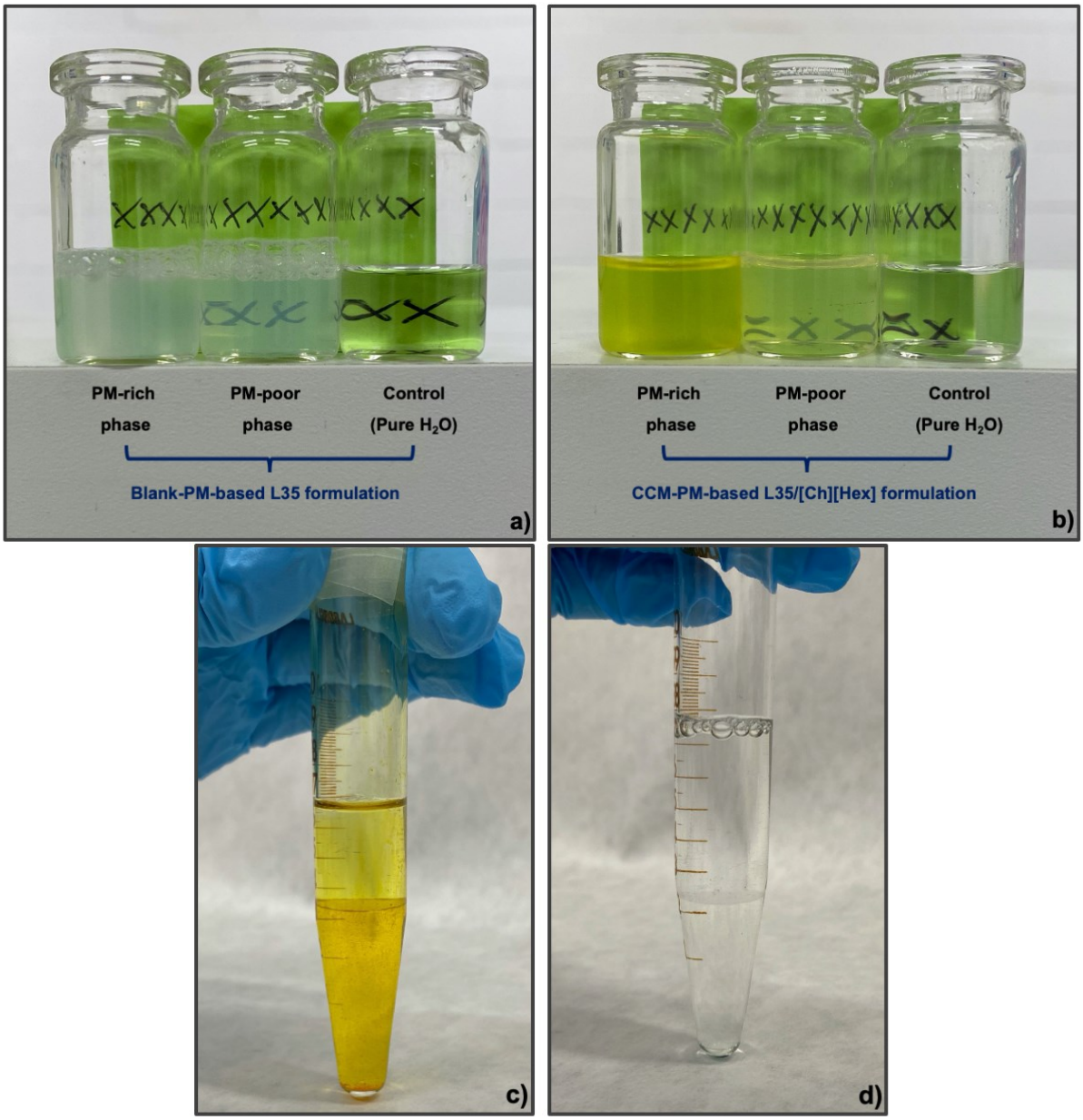
Table S1. Proton nuclear magnetic resonance (^{1}H NMR) spectra of the synthesized ionic liquids.

Ionic liquids	^{1}H NMR
Cholinium acetate [Ch]Cl	^{1}H NMR (600 MHz, D_2O) δ ppm: 1.94 (3H, s, CH_3CO), 3.21 (9H, s, $3CH_3N$), 3.53 (2H, m, CH_2CH_2OH), 4.05 (2H, m, CH_2OH)
Cholinium propanoate [Ch][Pro]	^{1}H NMR (600 MHz, D_2O) δ ppm: 0.91 (3H, t, CH_3CH_2, 7.60 Hz), 2.04 (2H, q, CH_2CO 7.60 Hz), 3.07 (9H, s, $3CH_3N$), 3.92 (2H, t, CH_2CH_2OH), 3.38 (2H, s, CH_2OH)
Cholinium butanoate [Ch][But]	^{1}H NMR (600 MHz, D_2O) δ ppm: 0.76 (3H, t, CH_3CH_2, 7.47 Hz), 1.43 (2H, m, CH_3CH_2), 2.04 (2H, t, CH_2CO, 7.47 Hz), 3.07 (9H, s, $3CH_3N$), 3.92 (2H, m, CH_2CH_2OH), 3.38 (2H, s, CH_2OH)
Cholinium hexanoate [Ch][Hex]	^{1}H NMR (600 MHz, DMSO-*d6*) δ ppm: 0.95 (3H, t, CH_3CH_2), 1.24 (4H, m, $CH_3(CH_2CH_2)$; 1.64 (2H, m, CH_3CH_2), 2.16 (2H, q, CH_2CO), 3.23 (9H, 2 s, $3CH_3N$), 3.51 (2H, t, CH_2CH_2OH), 4.02 (2H, s, CH_2OH)

Table S2. Zeta (ζ) potential determined by dynamic light scattering (DLS) parameters before (blank polymeric micelles PMs) and after curcumin (CCM) encapsulation in 2.0 wt% L35/buffer + ionic liquid (IL)-based ATPMS formulations after 48 h of storage time, under physiological conditions (*i.e.*, PBS buffer pH 7.4 at 37.0ºC). Error bars correspond to 95% confidence levels for three independent measurements.

Systems/ Formulations	**ζ potential (mV)**	
	Before encapsulation (blank PMs)	**After encapsulation**
*Control	-5.4 ± 2.3	-1.5 ± 0.5
3.0 M [Ch]Cl	-20.2 ± 0.6	-18.4 ± 1.0
2.5 M [Ch][Ac]	-19.5 ± 0.5	-18.1 ± 0.5
2.0 M [Ch][Pro]	-19.1 ± 1.2	-17.2 ± 0.6
1.2 M [Ch][But]	-17.2 ± 0.8	-15.4 ± 0.4
0.2 M [Ch][Hex]	-16.6 ± 0.5	-14.6 ± 1.0

*Control corresponds to samples of polymeric micelles without ionic liquids in the formulation.


PM-rich phase
PM-poor phase
Control (Pure H_2O)
Blank-PM-based L35 formulation
a)
PM-rich phase
PM-poor phase
Control (Pure H_2O)
CCM-PM-based L35/[Ch][Hex] formulation
b)
c)
d)

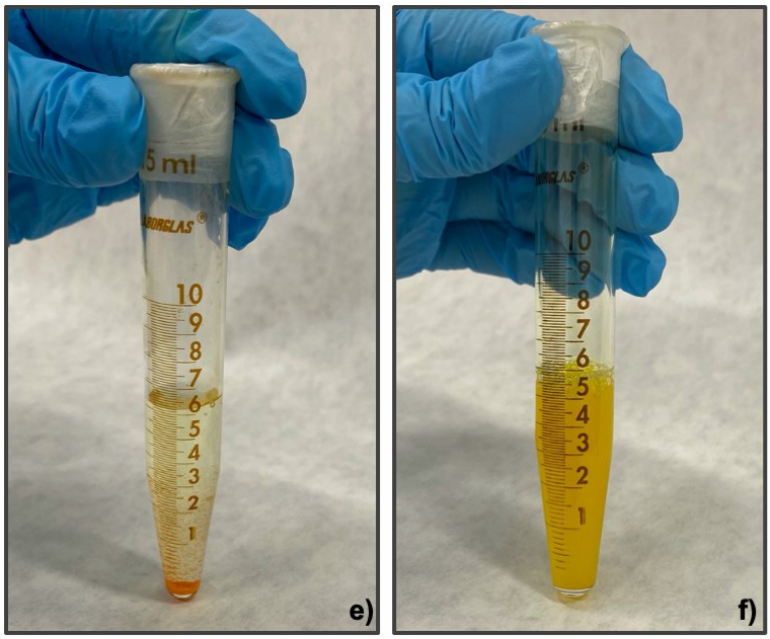


Figure S1. PM-based L35/0.2 M [Ch][Hex] phases (**a**) without CCM and (**b**) with CCM. The top and bottom phases are the PM-poor and PM-rich phases, respectively, in (c) and (**d**). CCM is present in (**c**), but absent in (**d**). (**e**) CCM in an aqueous solution where precipitation on the wall and mainly in the bottom of the tube can be observed. (**f**) CCM completely solubilized in a Pluronic L35 aqueous solution (with 2.0 wt% + 0.2 M [Ch][Hex]) below the LCST.