

Electronic Supporting Information

Thermoresponsive polymers in non-aqueous solutions

Matilde Concilio¹, Valentin P. Beyer^{1,2}, C. Remzi Becer^{1*}

¹ Department of Chemistry, University of Warwick, Coventry, CV4 7AL, United Kingdom

² Polymer Chemistry Laboratory, School of Engineering and Materials Science, Queen Mary University of London, London, E1 4NS, United Kingdom

*Corresponding author: remzi.becer@warwick.ac.uk

Table S1. Overview of polymers showing a thermoresponsive behaviour in methanol.

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref.
MeOH	Poly(γ -4-oligo(ethylene glycol) benzyl-L-glutamate)- <i>random</i> -(γ -benzyl-L-glutamate))	0.2 mg mL ⁻¹	UCST (@ 4)	110
MeOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized triethylene glycol monomethylether	1 mg mL ⁻¹	UCST (~ 55)	93
MeOH	Poly(γ -4-(4-propoxyphenoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (@ 49.5)	93
MeOH	Poly(γ -4-(2-(2-methoxyethoxy) ethoxycarbonyl)benzyl-L-glutamate)	1 mg mL ⁻¹	UCST (@ 36.4)	98
MeOH	Poly(γ -4-(2-(2-(2-methoxyethoxy) ethoxy)ethoxycarbonyl) benzyl-L-glutamate)	1 mg mL ⁻¹	UCST (@ 16.0)	98
MeOH	Poly(γ -propyl-L-glutamate) with <i>p</i> -tolyl pendants and 3-methyl-1,2,3-triazolium iodide linkages	0.5 mg mL ⁻¹	UCST (~ 26.8)	99
MeOH	Poly(γ -propyl-L-glutamate) with <i>p</i> -tolyl pendants and 3-methyl-1,2,3-triazolium tetrafluoroborate linkages	10 mg mL ⁻¹	UCST (ND)	99
MeOH	Poly(γ -benzyl-L-glutamate) alkyl conjugates	1 mg mL ⁻¹	UCST (@ 50-55)	91
MeOH	Poly(γ -propyl-L-glutamate) tetra- <i>O</i> -acetyl-D-(+)-mannopyranoside conjugate	5 mg mL ⁻¹	UCST (@ 27.4)	100
MeOH	Poly(γ -propyl-L-glutamate) tetra- <i>O</i> -acetyl-D-(+)-mannopyranoside (<i>x</i>) and tetra- <i>O</i> -hydroxyl-D-(+)-mannopyranoside (<i>y</i>) conjugate (<i>x</i> = 85%, <i>y</i> = 15%)	5 mg mL ⁻¹	UCST (@ 33.4)	100
MeOH	Poly(γ -propyl-L-glutamate) tetra- <i>O</i> -acetyl-D-(+)-mannopyranoside (<i>x</i>) and tetra- <i>O</i> -hydroxyl-D-(+)-mannopyranoside (<i>y</i>) conjugate (<i>x</i> = 44%, <i>y</i> = 56%)	5 mg mL ⁻¹	UCST (@ 35.0)	100
MeOH	Carboxyl-containing poly(<i>N</i> -allyl glycine- <i>r</i> - <i>N</i> -octyl glycine)	2 mg mL ⁻¹	UCST (@ 50.8)	120
MeOH	Poly(2-(2-(2-Acetoxyethoxy)ethoxy)ethyl methacrylate)	1 wt%	UCST (@ 26)	101
MeOH	Poly(2-(2-(2-(2-hydroxyethoxy)ethoxy)ethoxy)ethyl methacrylate)	1 wt%	UCST (@ 16.2)	101
MeOH	Poly(2-(2-(2-(2-(2-Acetoxy)ethoxy) ethoxy) ethoxy) ethoxy) ethyl methacrylate)	1 wt%	UCST (@ 4.5)	101
MeOH	Poly(<i>N</i> -propionyl-aspartic acid/ethylene glycol)	0.5 wt%	UCST (ND)	121
MeOH	Imidazolium ionic liquid-based nanogels	4.5 wt%	UCST (~ 25)	102
MeOH	Imidazolium ionic liquid-based nanogels	4.5 wt%	Sol-gel transition (~ 7)	102
MeOH	Poly(<i>N</i> -cyclopropyl-2-cyano-hex-4-enamide)	10 mg mL ⁻¹	UCST (~ 63)	103
MeOH	Poly(<i>N</i> -(6-acetamidopyridin-2-yl)acrylamide)	1 mg mL ⁻¹	UCST (@ 50)	73

MeOH	Poly(methyl 4-(2-(acryloyloxy)propanamido)butanoate)	1 wt%	UCST (@ 6-27)	104
MeOH	Poly(1-(cyclohexylamino)-1-oxopropan-2-yl acrylate)	1 wt%	UCST (@ -37- -20)	104
MeOH	Poly(2-methoxyethyl methacrylate)-Fe ₃ O ₄ hybrid nanoparticles	n/a	UCST (~ 19-38)	122
MeOH	Poly(octadecyl vinyl ether- <i>random</i> -2-methoxyethyl vinyl ether)	1 wt%	UCST (~ 20)	109
MeOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -diethylamine)	2 wt%	LCST (@ 44-53.1)	123
MeOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -diethylamine)	2 wt%	LCST (@ 39.5-58)	112
MeOD	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -diethylamine)	2 wt%	LCST (@ 23)	112
MeOH/EtOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -diethylamine)	2 wt%	LCST (@ 65)	112

Table S2. Overview of polymers showing a thermoresponsive behaviour in ethanol.

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref.
EtOH	Poly(ethylene oxide)	0.01-0.165 vol%	UCST (~ -5-10)	124
EtOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized triethylene glycol monomethylether	1 mg mL ⁻¹	UCST (@ 70.5)	93
EtOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (@ 53.1)	93
EtOH	Poly(γ -4-(4-propoxyphenoxy)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (@ 64)	93
EtOH	Poly(γ -4-oligo(ethylene glycol) benzyl-L-glutamate)- <i>random</i> -(γ -benzyl-L-glutamate))	0.2 mg mL ⁻¹	UCST (@ 27.6-63.1)	110
EtOH	Poly(γ -4-(2-(2-methoxyethoxy) ethoxycarbonyl)benzyl- L-glutamate)	1 mg mL ⁻¹	UCST (@ 50.6)	98
EtOH	Poly(γ -4-(2-(2-(2-methoxyethoxy) ethoxy)ethoxycarbonyl) benzyl- L-glutamate)	1 mg mL ⁻¹	UCST (@ 40.6)	98
EtOH	Polypeptide bearing Azobenzene and triethylene glycol spacers and 1-butylimidazolium side-chain end groups	8 mg mL ⁻¹	UCST (~ 30)	105
EtOH	Poly(γ -benzyl-L-glutamate) alkyl conjugates	1 mg mL ⁻¹	UCST (@ 56.9-71.1)	91
EtOH	Poly(γ -propyl-L-glutamate) tetra- <i>O</i> -acetyl-D-(+)-mannopyranoside conjugate	1 mg mL ⁻¹	UCST (@ 51.9)	100
EtOH	Poly(γ -propyl-L-glutamate) tetra- <i>O</i> -acetyl-D-(+)-mannopyranoside (x) and tetra- <i>O</i> -hydroxyl-D-(+)-mannopyranoside (y) conjugate (x= 85%, y= 15%)	1 mg mL ⁻¹	UCST (~ 53)	100
EtOH	Poly(γ -propyl-L-glutamate) tetra- <i>O</i> -acetyl-D-(+)-mannopyranoside (x) and tetra- <i>O</i> -hydroxyl-D-(+)-mannopyranoside (y) conjugate (x= 44%, y= 56%)	1 mg mL ⁻¹	UCST (~ 60)	100
EtOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 21.9)	82
EtOH	Poly(2-(2-(2-acetoxyethoxy)ethoxy)ethyl methacrylate)	1 wt%	UCST (@ 55)	101
EtOH	Poly(2-(2-(2-(2-hydroxyethoxy)ethoxy)ethoxy)ethyl methacrylate)	1 wt%	UCST (@ 45)	101
EtOH	Poly(2-(2-(2-(2-(2-acetoxy)ethoxy) ethoxy) ethoxy) ethoxy) ethyl methacrylate)	1 wt%	UCST (@ 36)	101
EtOH	Poly(2-(2-(2-(2-(2-propionyloxy)ethoxy)ethoxy)ethoxy)ethoxy)ethyl methacrylate)	1 wt%	UCST (@ 27)	101
EtOH	Poly(2-(2-(2-(2-(2-butyrylacyloxy)ethoxy) ethoxy) ethoxy) ethoxy) ethyl methacrylate)	1 wt%	UCST (@ 8)	101
EtOH	Poly(2-(2-(2-acetoxyethoxy)ethoxy)ethyl methacrylate)	1 wt%	UCST (@ 55)	101
EtOH	Poly(2-(2-methoxyethoxy)ethyl methacrylate)	2 wt%	UCST (@ 13.4-20.6)	123
EtOH	Poly(2-(2-(2-(2-(tetrahydrofuran-2-yl)oxy)ethoxy)-ethoxy)ethoxy) ethyl methacrylate)	1 wt%	UCST (~25)	106
EtOH	Poly(2-(dimethylamino) ethyl methacrylate- <i>co</i> -methacrylic acid- <i>co</i> -oligo(ethylene glycol) methyl ether methacrylate)	1 mg mL ⁻¹	UCST (~ 10)	107

EtOH	Poly(2-(dimethylamino)ethyl methacrylate- <i>b</i> -3-phenylpropyl methacrylate)	21 wt%	Sol-gel transition (~ 70)	108
EtOH	Poly(methyl acrylate)	5 mg mL ⁻¹	UCST (@ 60)	125
EtOH	Poly(styrene- <i>b</i> -methyl acrylate)	5 mg mL ⁻¹	UCST (~ 70)	125
EtOH	Poly(methyl acrylate- <i>b</i> -diethylene glycol ethyl ether acrylate)	5 mg mL ⁻¹	UCST (~5)	84
EtOH	Poly(1-(benzylamino)-1-oxopropan-2-yl acrylate)	1 wt%	UCST (@ 55-74)	104
EtOH	Poly(methyl 4-(2-(acryloyloxy)propanamido)butanoate)	1 wt%	UCST (@ 6-19)	104
EtOH	Poly(1-cyano- <i>N</i> -propylcarboxyamidovinylcyclopropane)	1 mg mL ⁻¹	UCST (~34)	126
EtOH	Poly(<i>N</i> -isopropyl-2-cyano-4-enamide)	10 mg mL ⁻¹	UCST (@ 40)	103
EtOH	Poly(<i>N</i> -butyl-2-cyano-4-enamide)	10 mg mL ⁻¹	UCST (@ 23)	103
EtOH	Poly(<i>N</i> -hexyl-2-cyano-4-enamide)	10 mg mL ⁻¹	UCST (@ 15)	103
EtOH	Poly(<i>N</i> -(2-ethyl)hexyl-2-cyano-4-enamide)	10 mg mL ⁻¹	UCST (@ 25)	103
EtOH	Poly(2-nonyl-2-oxazoline)	5 mg mL ⁻¹	UCST (~ 48)	86
EtOH	Poly(2-benzyl-2-oxazoline)	5 mg mL ⁻¹	UCST (~ -12)	86
EtOH	Poly(2-phenyl-2-oxazoline)	5 mg mL ⁻¹	UCST (@ 48.1)	88
EtOH	Poly(2-phenyl-2-oxazoline)	5 mg mL ⁻¹	UCST (~ 40)	89
EtOH	Poly(2-nonyl-2-oxazoline- <i>stat</i> -2-phenyl-2-oxazoline)	5 mg mL ⁻¹	UCST (~ 10)	89
EtOH	Poly(octadecyl vinyl ether- <i>random</i> -2-methoxyethyl vinyl ether)	1 wt%	UCST (~ 25)	109

Table S3. Overview of polymers showing a thermoresponsive behaviour in 1-propanol.

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref.
PrOH	Poly((γ -4-oligo(ethylene glycol) benzyl-L-glutamate)- <i>random</i> -(γ -benzyl-L-glutamate))	0.2 mg mL ⁻¹	UCST (@ 25.6-90)	110
PrOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized triethylene glycol monomethylether	1 mg mL ⁻¹	UCST (@72.5)	93
PrOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (@55.5)	93
PrOH	Poly(γ -4-(4-propoxyphenoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (@65.6)	93
PrOH	Poly(γ -4-(2-(2-methoxyethoxy) ethoxycarbonyl)benzyl- L-glutamate)	1 mg mL ⁻¹	UCST (@ 52.4)	98
PrOH	Poly(γ -4-(2-(2-(2-methoxyethoxy) ethoxy)ethoxycarbonyl) benzyl- L-glutamate)	1 mg mL ⁻¹	UCST (@ 40.7)	98
PrOH	Poly(γ -propyl-L-glutamate) tetra-O-acetyl-D-(+)-mannopyranoside	1 mg mL ⁻¹	UCST (@ 58.3)	100
PrOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 29.1)	82
PrOH	Poly(2-(2-(2-(2-((tetrahydrofuran-2-yl)oxy)ethoxy)ethoxy)ethoxy) ethyl methacrylate)	1 wt%	UCST (~ 22)	106
PrOH	Poly(2-hydroxyethyl methacrylate)	1 wt%	UCST (@ 35.8-45.9)	111
PrOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -dibutylamine)	2 wt%	UCST (@ 48.0)	112
PrOH/BuOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -dibutylamine)	2 wt%	UCST (@ 29.0)	112
PrOH/MeOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -dibutylamine)	2 wt%	UCST (@ 75.0)	112

PrOH/EtOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -dibutylamine)	2 wt%	UCST (@ 75.0)	112
-----------	--	-------	---------------	-----

Table S4. Overview of polymers showing a thermoresponsive behaviour in 2-propanol.

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref.
<i>i</i> PrOH	Poly(γ -propyl-L-glutamate) tetra- <i>O</i> -acetyl-D-(+)-mannopyranoside conjugate	1 mg mL ⁻¹	UCST (@ 62.2)	100
<i>i</i> PrOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized triethylene glycol monomethylether	1 mg mL ⁻¹	UCST (@ 74.7)	93
<i>i</i> PrOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (@ 58)	93
<i>i</i> PrOH	Poly(γ -4-(4-propoxyphenoxy)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (@ 66.6)	93
<i>i</i> PrOH	Poly(ethylene glycol) 6 kDa	5 mg mL ⁻¹	UCST (@ 41.5)	127
<i>i</i> PrOH	Poly(ethylene glycol) 6 kDa	0.050 wt%	UCST (@ 21)	113
<i>i</i> PrOH	Poly(acrylic acid)/poly(ethylene glycol) blend	0.0625/0.050 wt%	UCST (@ 48)	113
<i>i</i> PrOH	Poly(poly(ethylene glycol) methacrylate)	0.0625 wt%	UCST (< 5)	113
<i>i</i> PrOH	Poly(acrylic acid)/poly(poly(ethylene glycol) methacrylate) blend	0.0625/0.0625 wt%	UCST (@ 42)	113
<i>i</i> PrOH/MeOH	Poly(acrylic acid)-poly(ethylene glycol) blend	0.0625/0.050 wt%	UCST (~ 54-45)	113
<i>i</i> PrOH/MeOH	Poly(acrylic acid)-poly(poly(ethylene glycol) methacrylate) blend	0.0625/0.0625 wt%	UCST (~ 42-22)	113
<i>i</i> PrOH	Poly((ethylene glycol) methyl ether methacrylate- <i>b</i> -methyl methacrylate)	3 wt%	UCST (~ 24)	114
<i>i</i> PrOH	Poly((ethylene glycol) methyl ether methacrylate- <i>b</i> -methyl methacrylate- <i>b</i> -4-(diphenylphosphino)styrene-Ru(II))	3 wt%	UCST (~ 27)	114
<i>i</i> PrOH	PEG-armed star polymers Poly((ethylene glycol) methyl ether methacrylate- <i>b</i> -methyl methacrylate- <i>b</i> -ethylene glycol dimethyl acrylate)	3 wt%	UCST (~ 30)	114
<i>i</i> PrOH	PEG-armed Ru(II)-star polymers Poly((ethylene glycol) methyl ether methacrylate- <i>b</i> -methyl methacrylate- <i>b</i> -ethylene glycol dimethylacrylate- <i>b</i> -4-(diphenylphosphino)styrene-Ru(II))	3 wt%	UCST (~ 31)	114
<i>i</i> PrOH	Poly(oligo(ethylene glycol) methyl ether methacrylate 6.3 kDa)	5 mg mL ⁻¹	UCST (@ 10.8)	115
<i>i</i> PrOH	Poly(ethylene glycol) methyl ether methacrylate 17.1 kDa	3 wt%	UCST (~ 23)	114
<i>i</i> PrOH	Poly(oligo(ethylene glycol) methyl ether methacrylate 23.2 kDa)	5 mg mL ⁻¹	UCST (@ 35.6)	82
<i>i</i> PrOH	Poly(oligo(ethylene glycol) phenyl ether acrylate- <i>co</i> -oligo(ethylene glycol) methyl ether methacrylate)	10 mg mL ⁻¹	UCST (@ 35.1-75.4)	83
<i>i</i> PrOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N</i> -isopropylacrylamide)	5 mg mL ⁻¹	UCST (< 0)	115
<i>i</i> PrOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N</i> -isopropylacrylamide)	20 mg mL ⁻¹	UCST (@ 10.6)	128
<i>i</i> PrOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N,N</i> -diethylacrylamide)	5 mg mL ⁻¹	UCST (@ 0.5)	115
<i>i</i> PrOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N,N</i> -diethylacrylamide)	20 mg mL ⁻¹	UCST (@ 11.8)	128
<i>i</i> PrOH	Poly(2-(dimethylamino) ethyl methacrylate- <i>co</i> -methacrylic acid))- <i>graft</i> -oligo(ethylene glycol) methyl ether methacrylate	1 mg mL ⁻¹	UCST (@ 50)	107
<i>i</i> PrOH	Poly(vinylidene fluoride)- <i>graft</i> -poly(diethylene glycol methyl ether methacrylate)	0.09 %w/v	UCST (@ 27.5)	85
<i>i</i> PrOH	Poly(2-(2-methoxyethoxy)ethyl methacrylate)	2 wt%	UCST (@ 27.8)	123
<i>i</i> PrOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -diethylamine)	2 wt%	UCST (@ 24.3)	123
<i>i</i> PrOH	Poly(<i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -diethylamine)	2 wt%	UCST (@ 43.5)	112

<i>i</i> PrOH	Poly(2-(2-methoxyethoxy)ethyl methacrylate- <i>b</i> - <i>N</i> -(4-vinylbenzyl)- <i>N,N</i> -diethylamine)	2 wt%	UCST (@ 23.2)	123
<i>i</i> PrOH	Poly(2-(2-(2-(2-((tetrahydrofuran-2-yl)oxy)ethoxy)ethoxy)ethoxy)ethyl methacrylate)	1 wt%	UCST (~ 35)	106
<i>i</i> PrOH	Poly(oligo(ethylene glycol) methyl ether acrylate)	10 mg mL ⁻¹	UCST (@ 11.8)	83
<i>i</i> PrOH	Poly(oligo(ethylene glycol) phenyl ether acrylate- <i>co</i> -oligo(ethylene glycol) methyl ether acrylate)	10 mg mL ⁻¹	UCST (@ 14.9-73.6)	83
<i>i</i> PrOH- <i>d</i> ₃	Poly((oligo(ethylene glycol) phenyl ether acrylate- <i>co</i> -oligo(ethylene glycol) methyl ether acrylate)- <i>b</i> - <i>N,N</i> -dimethyl acrylamide)	20 mg mL ⁻¹	UCST (@ 45.2)	83
<i>i</i> PrOH	Poly(oligo(ethylene glycol)acrylamide) M _n OEG= 750 Da	5 mg mL ⁻¹	UCST (@ 16)	127
<i>i</i> PrOH	Poly(oligo(ethylene glycol)acrylamide) M _n OEG= 5 kDa	5 mg mL ⁻¹	UCST (@ 38.5)	127
<i>i</i> PrOH	Poly(oligo(ethylene glycol)methacrylamide) M _n OEG= 350 Da	5 mg mL ⁻¹	UCST (@ 8.1)	127
<i>i</i> PrOH	Poly(oligo(ethylene glycol)methacrylamide) M _n OEG= 750 Da	5 mg mL ⁻¹	UCST (@ 17.4)	127
<i>i</i> PrOH	Poly(tri(ethylene glycol) methacrylamide)	5 mg mL ⁻¹	UCST (@ -3)	127
<i>i</i> PrOH	Poly(<i>N</i> -(2-methacryloxyethyl)pyrrolidone]- <i>b</i> -methyl methacrylate)	5 wt%	Sol-gel transition (@ 27-50)	116

Table S5. Overview of polymers showing a thermoresponsive behaviour in other alcoholic solvents.

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref.
BuOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 36.6)	82
BuOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	5 mg mL ⁻¹	UCST (@ 5)	115
BuOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N</i> -isopropylacrylamide)	5 mg mL ⁻¹	UCST (@ 3)	115
BuOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N,N</i> -diethylacrylamide)	5 mg mL ⁻¹	UCST (@ 2.5)	115
BuOH	Poly((γ -4-oligo(ethylene glycol) benzyl-L-glutamate)- <i>random</i> -(γ -benzyl-L-glutamate))	0.2 mg mL ⁻¹	UCST (@ 37.4-84)	110
BuOH	Poly(γ -propyl-L-glutamate) tetra-O-acetyl-D-(+)-mannopyranoside conjugate	1 mg mL ⁻¹	UCST (@ 69.9)	100
BuOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized triethylene glycol monomethylether	1 mg mL ⁻¹	UCST (~78)	93
BuOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (~60)	93
BuOH	Poly(γ -4-(4-propoxyphenoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (~69)	93
BuOH	Poly(γ -4-(2-(2-methoxyethoxy) ethoxycarbonyl)benzyl- L-glutamate)	1 mg mL ⁻¹	UCST (@ 56.0)	98
BuOH	Poly(γ -4-(2-(2-(2-methoxyethoxy) ethoxy)ethoxycarbonyl) benzyl- L-glutamate)	1 mg mL ⁻¹	UCST (@ 42.7)	98
BuOH	Poly(2-hydroxyethyl methacrylate)	1 wt%	UCST (@ 60.8-73.0)	111
BuOH	Poly(<i>N</i> -phenyl maleimide- <i>co</i> - <i>n</i> -octadecyl vinyl ether)	0.1 wt%	UCST (@ 67)	117
<i>i</i> BuOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 30.4)	82
<i>i</i> BuOH	Poly(2-hydroxyethyl methacrylate)	1 wt%	UCST (@ 68.8-71.4)	111
<i>sec</i> BuOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@26.4)	82
<i>sec</i> BuOH	Poly(2-hydroxyethyl methacrylate)	1 wt%	UCST (@ 13.5-14.0)	111
2-Methyl-1-butanol	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 22.2)	82
Glycerol	Poly(2-hydroxyethyl methacrylate)	1 wt%	UCST (@ 71.8-83.6)	111

PeOH	Poly(γ -4-oligo(ethylene glycol) benzyl-L-glutamate)- <i>random</i> -(γ -benzyl-L-glutamate))	0.2 mg mL ⁻¹	UCST (@ 43.3-86)	110
PeOH	Poly(γ -propyl-L-glutamate) tetra-O-acetyl-D-(+)-mannopyranoside conjugate	1 mg mL ⁻¹	UCST (@ 77.9)	100
PeOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized triethylene glycol monomethylether	1 mg mL ⁻¹	UCST (~80)	93
PeOH	Poly(γ -4-(propoxycarbonyl)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (~63)	93
PeOH	Poly(γ -4-(4-propoxyphenoxy)benzyl-L-glutamate)-oligo(ethylene glycol) derived from azido functionalized poly(ethylene glycol) methylether 350	1 mg mL ⁻¹	UCST (~72)	93
PeOH	Poly(γ -4-(2-(2-methoxyethoxy) ethoxycarbonyl)benzyl-L-glutamate)	1 mg mL ⁻¹	UCST (@ 59.8)	98
PeOH	Poly(γ -4-(2-(2-(2-methoxyethoxy) ethoxy)ethoxycarbonyl) benzyl-L-glutamate)	1 mg mL ⁻¹	UCST (@ 49.8)	98
PeOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 40.9)	82
<i>i</i> PeOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 35.7)	82
4-Methyl-2-pentanol	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 34.0)	82
HexOH	Poly(<i>N</i> -phenyl maleimide- <i>co</i> - <i>n</i> -octadecyl vinyl ether)	0.1 wt%	UCST (~ 47)	117
HexOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 46.2)	82
HepOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 53.3)	82
2-Octanol	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 47.7)	82
OctOH	Poly(<i>N</i> -phenyl maleimide- <i>co</i> - <i>n</i> -octadecyl vinyl ether)	0.1 wt%	UCST (~ 35)	117
OctOH	Poly(oligo(ethylene glycol) methyl ether methacrylate)	5 mg mL ⁻¹	UCST (@ 23)	115
OctOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N,N</i> -diethylacrylamide)	1 mg mL ⁻¹	UCST (@ 25)	128
OctOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N,N</i> -diethylacrylamide)	5 mg mL ⁻¹	UCST (@ 25)	115
OctOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> - <i>N</i> -isopropylacrylamide)	5 mg mL ⁻¹	UCST (@ 28)	115
OctOH	Poly(oligo(ethylene glycol) methyl ether methacrylate- <i>b</i> -(<i>N</i> -isopropylacrylamide- <i>co</i> -pentafluorophenyl acrylate))	1 mg mL ⁻¹	Self-assembly (@ 0)	115
OctOH	Poly(ethylene glycol) 6 kDa	5 mg mL ⁻¹	UCST (@ 49.2)	127
OctOH	Poly(oligo(ethylene glycol)acrylamide) M _n OEG= 750 Da	5 mg mL ⁻¹	UCST (@ 18.9)	127
OctOH	Poly(oligo(ethylene glycol)acrylamide) M _n OEG= 5 kDa	5 mg mL ⁻¹	UCST (@ 45.5)	127
OctOH	Poly(tri(ethylene glycol)methacrylamide)	5 mg mL ⁻¹	UCST (@ 2)	127
OctOH	Poly(oligo(ethylene glycol)methacrylamide) M _n OEG= 350 Da	5 mg mL ⁻¹	UCST (@ 8.8)	127
OctOH	Poly(oligo(ethylene glycol)methacrylamide) M _n OEG= 750 Da	5 mg mL ⁻¹	UCST (@ 18.6)	127
Dodecanol	Poly(oligo(ethylene glycol) methyl ether methacrylate)	16 mg mL ⁻¹	UCST (@ 75.4)	82
CyclohexOH	Polystyrene	~ 1-20 wt%	UCST (~ 28-80)	118
CyclohexOH	Poly(methyl methacrylate)	~ 0.2-13 wt%	UCST (~ 70-80)	118
CyclohexOH	Poly(styrene- <i>b</i> -methyl methacrylate)	~ 0.15-20 wt%	UCST (~ 65-75)	118
BnOH	Poly(γ -benzyl L-glutamate)	15-40 wt%	Sol-gel transition (@ 60-70)	119

Table S6. Overview of thermoresponsive polymers in aliphatic hydrocarbons, aromatic hydrocarbons, and oils.

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref
---------	-----------------	--------------	---------------------------------	-----

Hexane/achiral benzyl amine	Substituted chiral poly(phenylacetylene)	1 mmol L ⁻¹	Conformational transition (@3)	129
Hexane/achiral benzyl amine	Substituted chiral/achiral copoly(phenylacetylene)	1 mmol L ⁻¹	Conformational transition (@16)	129
Hexane	Poly(octadecyl vinyl ether)	1 wt%	UCST (@ 9)	147
Hexane	Poly(octadecyl vinyl ether)	1 wt%	UCST (~ 9)	109
Methylcyclohexane	Polystyrene	1-25 wt%	LCST (~ 215-250) UCST (~ 35-70)	130
Cyclohexane	Polystyrene	1-25 wt%	LCST (~ 215-240) UCST (~ 10-30)	130
Cyclohexane	Polystyrene	0.005-0.4 wt%	UCST (~ 3.1-28.3)	21
Cyclohexane	Poly(styrene)	5 mg mL ⁻¹	ND	148
Cyclohexane	Star poly(styrene)	5 mg mL ⁻¹	ND	148
Heptane	Polystyrene- <i>b</i> -polyisoprene	0.001-10 mg mL ⁻¹	Cylinders-to-spheres (~35) and vesicles-to-cylinders transition (~ 40)	131
<i>n</i> -Octane	Poly(stearyl methacrylate- <i>b</i> -3-phenylpropyl methacrylate)	20-30 wt%	Worm-to-sphere transition (~ 70)	132
Decane	Poly(octadecyl vinyl ether)- <i>b</i> -poly(isobutyl vinyl ether)ODVE and IBVE	20 wt%	Sol-gel transition (~ 17)	109
Decane	Poly(<i>tert</i> -octyl acrylamide- <i>b</i> - <i>N,N</i> -dimethylacrylamide)	1.0 wt%	UCST (@ 2)	137
Propyl acetate / <i>n</i> -alkanes	Poly(2-chloroethyl vinyl ether- <i>alt</i> -maleic anhydride)	0.1 wt%	LCST (~ 37- 52)	149
Propyl acetate/ <i>n</i> -alkanes	Poly(2-chloroethyl vinyl ether- <i>alt</i> -maleic anhydride)	1 wt%	LCST (@ 45.2-49.2)	150
<i>n</i> -Dodecane	Poly(benzyl methacrylate- <i>b</i> -lauryl methacrylate)	5-20 wt%	Worm-to-sphere transition (~ 50)	133
<i>n</i> -Dodecane	Graft-copolymers with polyolefin backbones and poly(butyl methacrylate- <i>stat</i> -lauryl methacrylate) side chains	2 mg mL ⁻¹	UCST (~ 80)	134
<i>n</i> -Dodecane	Poly(lauryl acrylate- <i>b</i> -benzyl acrylate)	15 wt%	Worm-to-sphere transition (~ 15)	135
<i>n</i> -Dodecane	Poly(<i>tert</i> -octyl acrylamide- <i>b</i> - <i>N,N</i> -dimethylacrylamide)	1.0 wt%	UCST (@ 27)	137
<i>n</i> -Dodecane	Poly(ϵ -allyl- ϵ -caprolactone) functionalized with alkyl thiols	1-100 mg mL ⁻¹	UCST (~ 40-50)	151
<i>n</i> -Dodecane/aqueous 0.3M NaNO ₃ solution (1:1)	Azobenzene randomly modified poly(sodium acrylate) + tetraethylene glycol monododecyl ether (surfactant)	6 mg mL ⁻¹	Increase (@ 18) and decrease (@ 26.7) of foamability	152
<i>n</i> -Tetradecane	Poly(stearyl methacrylate- <i>b</i> -3-phenylpropyl methacrylate)	20 wt%	Worm-to-sphere transition (~ 85)	136
<i>n</i> -Tetradecane	Poly(<i>tert</i> -octyl acrylamide- <i>b</i> - <i>N,N</i> -dimethylacrylamide)	1.0 wt%	UCST (@ 35)	137
<i>n</i> -Hexadecane	Poly(<i>tert</i> -octyl acrylamide- <i>b</i> - <i>N,N</i> -dimethylacrylamide)	1.0 wt%	UCST (@ 55)	137
<i>Iso</i> hexadecane	Poly(lauryl acrylate- <i>b</i> -benzyl acrylate)	15 wt%	Worm-to-sphere transition (~ 67)	135
Toluene	Poly(octadecyl vinyl ether)	1 wt%	UCST (~ 4)	109
Toluene	Poly(2-(4-biphenyloxy)ethyl vinyl ether)	1 wt%	UCST (~ 12)	109
Toluene	Poly[2-(4,4,5,5,6,6,7,7,7-nonafluoroheptyloxy)ethyl vinyl ether]	1 wt%	UCST (@ 69)	153
Toluene	Poly(3-((4R,5R)-4,5-bis(hydroxydiphenylmethyl)-2-methyl-1,3-dioxolane-2-yl)propyl acrylate) + chiral effectors	10 mg mL ⁻¹	UCST or sol-gel transition (ND)	138
Toluene	Poly(3-((4R,5R)-4,5-bis(hydroxydiphenylmethyl)-2-methyl-1,3-dioxolane-2-yl)propyl acrylate)+ (S) or (R)-2-methylpiperidine	25 mg mL ⁻¹	UCST (~10-30)- LCST (~20-60)- UCST (~45-75)	138
Toluene	Poly(vinyl phenol- <i>alt</i> - <i>N</i> -dodecyl maleimide)	1 wt%	UCST (~ 60)	139
Toluene	Poly(vinyl phenol- <i>alt</i> - <i>N</i> -octadecyl maleimide)	1 wt%	Sol-gel transition (~ RT)	139

Toluene	Poly(vinyl phenol- <i>alt</i> - <i>N</i> -dodecyl maleimide)	5 wt%	Sol-gel transition (~ RT)	139
Toluene	Poly(vinyl phenol- <i>alt</i> - <i>N</i> -octadecyl maleimide)	5 wt%	Sol-gel transition (~ RT)	139
Toluene	Poly(11-(4-((<i>E</i>)-4-butylstyryl)phenoxy)undecyl methacrylate)	2 wt%	UCST (@ 26.3)	140
Toluene	Poly(γ -benzyl-L-glutamate)	0.2-2 wt%	Sol-gel transition (~ 48-53)	154
Toluene/BuOH	Poly[2-(vinylxy)-ethyl-1-butylimidazolium chloride]	1 wt%	LCST (~ 60)	155
Toluene/2-amino-1-butanol	Substituted chiral poly(phenylacetylene)	1 mmol L ⁻¹	Conformational transition (ND)	129
Toluene/DMSO	Substituted chiral poly(phenylacetylene)	1 mmol L ⁻¹	Conformational transition (ND)	129
1,2,4-Triethylbenzene	Poly(11-(4-((<i>E</i>)-4-butylstyryl)phenoxy)undecyl methacrylate)	2 wt%	UCST (@ 49.7)	140
Diocetyl phthalate, dibutyl phthalate, diethyl phthalate	Poly(styrene- <i>b</i> -dimethylsiloxane)	1 wt%	Thermotropic transition (@ 70)	141
Hydrocarbon oil	Poly(lauryl methacrylate- <i>b</i> -styrene- <i>b</i> -lauryl methacrylate)	0.1-16 wt%	Swelling of micelles (~ 80)	142
Mineral oil	Poly(stearyl methacrylate- <i>b</i> -benzyl methacrylate)	10 wt%	Vesicle-to-worm transition (@ 135)	143
Polyalphaolefin	Poly(alkyl methacrylate)s with different alkyl side chain lengths	1 wt%	UCST (0.5-138)	144
Polyalphaolefin	Poly(<i>n</i> -butyl methacrylate- <i>co</i> - <i>n</i> -hexyl methacrylate)- <i>b</i> -poly(2-ethylhexyl methacrylate- <i>co</i> -lauryl methacrylate)- <i>b</i> -poly(<i>n</i> -butyl methacrylate- <i>co</i> - <i>n</i> -hexyl methacrylate)	14.3-15 wt%	Sol-gel transition (~ 0-63.5)	144
Decamethylcyclopentasiloxane silicone oil	Poly(dimethylsiloxane- <i>b</i> -2-(dimethylamino) ethyl methacrylate)	0.25-25 wt%	Worm-to-sphere transition (@ 32)	145
Yubase-4 oil	Poly(2-stearyl-2-oxazoline- <i>co</i> -2-ethyl-2-oxazoline)	5 mg mL ⁻¹	UCST (~80-49)	146
Yubase-4 oil	Poly(methacrylic acid- <i>co</i> -2-ethylhexyl methacrylate)- <i>graft</i> -poly(2-stearyl-2-oxazoline- <i>co</i> -2-ethyl-2-oxazoline)	5 mg mL ⁻¹	UCST (~40-51)	146

Table S7. Overview of thermoresponsive polymers in halogenated solvents.

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref
CHCl ₃	Poly(octadecyl vinyl ether)	1 wt%	UCST (ND)	147
CHCl ₃	Poly(octadecyl vinyl ether)	1 wt%	UCST (~ -2)	109
CHCl ₃	Poly[2-(vinylxy)-ethyl-1-butylimidazolium chloride]	2 wt%	LCST (@30)	155
CHCl ₃ /MeOH	Poly[2-(vinylxy)ethyl-4-methylpyridinium chloride]	1 wt%	LCST (~35)	155
CHCl ₃	Poly[2-(4,4,5,5,6,6,7,7,7-nonafluoroheptyloxy)ethyl vinyl ether]	1 wt%	UCST (~20)	153
CHCl ₃	Poly(isobutyl vinyl ether)- <i>b</i> -(2-(4,4,5,5,6,6,7,7,7-nonafluoroheptyloxy)ethyl vinyl ether)	0.5 wt%	Self-assembly (~25)	153
CHCl ₃	Poly(isobutyl vinyl ether)- <i>b</i> -(2-(4,4,5,5,6,6,7,7,7-nonafluoroheptyloxy)ethyl vinyl ether)	20 wt%	Sol-gel transition (~25)	153
CHCl ₃ (+ 2%EtOH)	Chiral-polymeric ionic liquids (CPILs) with benzyl <i>N</i> -substituent and an imidazole derived from (L)-valine	0.5 mg mL ⁻¹	LCST (@48.5)	156
CHCl ₃	CPIL-stabilized AuNPs	1 mg mL ⁻¹	LCST (@ 31)	156
CHCl ₃	Poly(7-methacryloyloxycoumarin)	0.1 wt%	LCST (@28)	157
CHCl ₃	Poly(arylene ether sulfone)	20 mg mL ⁻¹	LCST (@59)	163
CHCl ₃	Poly(3-((4 <i>R</i> ,5 <i>R</i>)-4,5-bis(hydroxydiphenylmethyl)-2-methyl-1,3-dioxolane-2-yl)propyl acrylate)	10 mg mL ⁻¹	UCST (~50)	138
CHCl ₃	Poly((-)-3-methoxycarbonyl-5-(<i>N</i> -methyl- <i>N</i> -(<i>S</i>)-(1-phenylethyl)carbonyl)phenylacetylene)	0.0001 mol L ⁻¹	<i>Cis-trans</i> isomerization (~ 15-20)	158
DCM	Poly(octadecyl vinyl ether)	1 wt%	UCST (ND)	147

DCM	Poly(octadecyl vinyl ether)	1 wt%	UCST (@14)	109
DCM	Poly(hexadecyl vinyl ether)	1 wt%	UCST (ND)	109
DCM	Poly(7-methacryloyloxy coumarin)	0.3wt%	LCST (~39)	157
DCM	Poly(3-((4R,5R)-4,5-bis(hydroxydiphenylmethyl)-2-methyl-1,3-dioxolane-2-yl)propyl acrylate)	10 mg mL ⁻¹	UCST (~43)	138
DCE	Poly(2-(3-Butylureido)propyl acrylate) + effectors	25 mg mL ⁻¹	LCST (@43-57) and UCST (@32-71)	159
DCE	Poly(3-(3-butylureido)propyl acrylate-stat- <i>N</i> -[3-(acryloyloxy)propyl]- <i>N,N,N</i> -triethylammonium tetrakis(3,5-bis(trifluoromethyl)phenyl)borate	25 mg mL ⁻¹	UCST (@65)	164
DCE	Poly(3-(3-butylureido)propyl acrylate) (PUA) + effector	25 mg mL ⁻¹	LCST (~ 33) and UCST (~38)	160
DCE	Poly(3-(3-butylureido)propyl methacrylate) (PUMA) + effector	25 mg mL ⁻¹	LCST (~30) and UCST (~24)	160
DCE	Poly(3-(3-butylureido)propyl vinyl ether) (PUVE) + effector	25 mg mL ⁻¹	LCST (~47) and UCST (~20)	160
DCE	Poly((1-pyrene)methyl acrylate) + effectors	10 mg mL ⁻¹	LCST (@43)	161
DCE	Poly(3-((4R,5R)-4,5-bis(hydroxydiphenylmethyl)-2-methyl-1,3-dioxolane-2-yl)propyl acrylate)	10 mg mL ⁻¹	UCST (~50)	138
1,1,2-Trichloroethane	Poly(7-methacryloyloxy coumarin)	0.3wt%	LCST (ND)	157
<i>o</i> -Dichlorobenzene	Poly[(5,6-difluoro-2,1,3-benzothiadiazol-4,7-diyl)-alt-(3,3''-di(2-octyl-dodecyl)-2,2',5',2''-quaterthiophen-5,5'''-diyl)]	5 mg mL ⁻¹	Disaggregation (~ 75)	162
<i>o</i> -Dichlorobenzene	Poly[(5,6-difluoro-2,1,3-benzothiadiazol-4,7-diyl)-alt-(3,3''-di(2-nonyltridecyl)-2,2',5',2''-quaterthiophen-5,5'''-diyl)]	5 mg mL ⁻¹	Disaggregation (~ 75)	162
Perfluoro(methylcyclohexane)	Poly[2-(4,4,5,5,6,6,7,7,7-nonafluoroheptyloxy)ethyl vinyl ether]	1 wt%	UCST (~10)	153
Perfluorodecalin	Poly[2-(4,4,5,5,6,6,7,7,7-nonafluoroheptyloxy)ethyl vinyl ether]	1 wt%	UCST (~20)	153

Table S8. Overview of thermoresponsive polymers in ionic liquids

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)	3 wt%	LCST (@ 105)	166
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)	3 wt%	LCST (@ 105)	165
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate- <i>co</i> -styrene)	3 wt%	LCST (~ 70-100)	166
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate- <i>co</i> -methyl methacrylate)	3 wt%	LCST (~ 120-140)	166
[C ₂ mim][NTf ₂]	Poly(methyl methacrylate)- <i>b</i> -poly(benzyl methacrylate)	2 wt%	LCST and LCMT (~ 120)	167
[C ₂ mim][NTf ₂]	Poly(styrene- <i>co</i> -methyl methacrylate)	3 wt%	LCST (~ 85-170) UCST (~ -5-10) LCST+UCST	168
[C ₂ mim][NTf ₂]	Poly(<i>cis</i> -4-phenylazophenyl methacrylate- <i>co</i> - benzyl methacrylate)	3 wt%	LCST (~ 102-103)	169
[C ₂ mim][NTf ₂]	Poly(<i>trans</i> -4-phenylazophenyl methacrylate- <i>co</i> - benzyl methacrylate)	3 wt%	LCST (~ 80-83)	169
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate- <i>co</i> -9-(4-vinylbenzyl)-9H-carbazole)	3 wt%	LCST (@ 68-86)	183
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate- <i>co</i> -9-(4-vinylbenzyl)-9H-carbazole)- <i>b</i> -poly(methyl methacrylate- <i>co</i> -styrene)	3 wt%	LCST (@ 97)	183
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)-derivatives	3 wt%	LCST (@ 42-87)	175
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(benzyl methacrylate)	0.1 wt%	LCMT (@ 134.5)	186
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(benzyl methacrylate)	20 wt%	Sol-gel (~ 100)	186

[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(2-phenylethyl methacrylate)	0.1 wt%	LCMT (@ 70)	187
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(2-phenylethyl methacrylate)	20 wt%	Sol-jamming micelle-gel (~ 40-100)	187
[C ₂ mim][NTf ₂]	Poly(<i>N</i> -isopropylacrylamide)	1 wt%	UCST (@ 34)	170
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)- <i>b</i> -poly(<i>N</i> -isopropylacrylamide)	1 wt%	LCMT (~ 140)	171
[C ₂ mim][NTf ₂]	Poly(acrylamide)	3 wt%	UCST (~ 150)	171
[C ₂ mim][NTf ₂]	Poly(benzyl methacrylate)- <i>b</i> -poly(<i>N</i> -isopropylacrylamide- <i>r</i> -acrylamide)	1 wt%	UCMT (~ 40) LCMT (~ 160)	171
[C ₂ mim][NTf ₂]	Poly(4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	3 wt%	UCST (@ 7.9-50.9)	189
[C ₂ mim][NTf ₂]	Poly(styrene)- <i>b</i> -poly(<i>N,N</i> -dimethylacrylamide)- <i>b</i> -poly(4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	1 wt%	UCST (~ 40)	190
[C ₂ mim][NTf ₂]	Poly(styrene)- <i>b</i> -poly(<i>N,N</i> -dimethylacrylamide)- <i>b</i> -poly(4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	15 wt%	Sol-gel (~ 85)	190
[C ₂ mim][NTf ₂]	Poly(<i>N</i> -isopropylacrylamide)- <i>b</i> -poly(ethylene oxide)- <i>b</i> -poly(<i>N</i> -isopropylacrylamide)	10 wt%	Sol-gel (~ 20)	172
[C ₂ mim][NTf ₂]	Poly(<i>N</i> -isopropylacrylamide)- <i>b</i> -poly(styrene)- <i>b</i> -poly(ethylene oxide)- <i>b</i> -poly(styrene)- <i>b</i> -poly(<i>N</i> -isopropylacrylamide)	10 wt%	Sol-gel (~ 39)	192
[C ₂ mim][NTf ₂]	Poly(ethyl glycidyl ether)	10 wt%	LCST (@ 84.4)	173
[C ₂ mim][NTf ₂]	Poly(ethyl glycidyl ether)	10 wt%	LCST (~ 80)	195
[C ₂ mim][NTf ₂]/[C ₄ mim][NTf ₂]	Poly(2-phenylethyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(2-phenylethyl methacrylate)	0.1 wt%	LCMT (@ 60-100)	188
[C ₂ mim][NTf ₂]/[C ₄ mim][NTf ₂]	Poly(2-phenylethyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(2-phenylethyl methacrylate)	20 wt%	Sol-gel (@ 25-65)	188
[C ₂ mim][NTf ₂]/[C ₄ mim][NTf ₂]	Poly(<i>n</i> -butyl methacrylate) 48 kDa	2 wt%	LCST (@ 108-RT)	174
[C ₂ mim][NTf ₂]/[C ₄ mim][NTf ₂]	Poly(<i>n</i> -butyl methacrylate)- <i>b</i> -poly(ethylene oxide)	1 wt%	LCMT (~ 35-125)	174
[C ₂ mim][NTf ₂]/[C ₆ mim][NTf ₂]	Poly(<i>n</i> -butyl methacrylate) 48 kDa	2 wt%	LCST (@ 108-247)	174
[C ₂ mim][NTf ₂]/[C ₄ mim]PF ₆	Poly(benzyl methacrylate)- <i>b</i> -poly(<i>N</i> -isopropylacrylamide)	1 wt%	UCMT (~ 30) LCMT (~ 130)	171
[C ₄ mim][NTf ₂]	Poly(<i>n</i> -butyl methacrylate) 48 kDa	0.25 wt%	LCST (@ 119)	174
[C ₄ mim][NTf ₂]	Poly(ethyl glycidyl ether)	10 wt%	LCST (@ 167.4)	173
[C ₄ mim][NTf ₂]	Poly(propylene oxide)	10 wt%	LCST (@ 48.0)	173
[C ₈ mim][NTf ₂]	Poly(3-methylbenzyl methacrylate)	3 wt%	LCST (@ 162)	175
[C ₈ mim][NTf ₂]	Poly(4-phenylbutyl methacrylate)	3 wt%	LCST (@ 242)	175
[C ₄ dmim][NTf ₂]	Poly(benzyl methacrylate)	3 wt%	LCST (@ 176)	175
[C ₄ dmim][NTf ₂]	Poly(2-phenylethyl methacrylate)	3 wt%	LCST (@ 136)	175
[C ₄ dmim][NTf ₂]	Poly(ethyl glycidyl ether)	10 wt%	LCST (@ 23.2)	173
[Azo][NTf ₂]/[C ₁ mim][NTf ₂]	Poly(2-phenylethyl methacrylate)	7 wt%	LCST (@ 38-125)	184
[Azo][NTf ₂]/[C ₁ mim][NTf ₂]	Poly(benzyl methacrylate)	7 wt%	LCST (@ 113-174)	184
[Azo][NTf ₂]/[C ₁ mim][NTf ₂]	Poly(benzyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(benzyl methacrylate)	0.1 wt%	LCMT (@ 55/65)	185
[Azo][NTf ₂]/[C ₁ mim][NTf ₂]	Poly(2-phenylethyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(2-phenylethyl methacrylate)	0.1 wt%	LCMT (@ 110/120)	185
[C ₁ mim][NTf ₂]	Poly(2-phenylethyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(2-phenylethyl methacrylate)	30 wt%	Sol-gel (@ 23)	176
[Azo][NTf ₂]/[C ₁ mim][NTf ₂]	Poly(2-phenylethyl methacrylate)- <i>b</i> -poly(methyl methacrylate)- <i>b</i> -poly(2-phenylethyl methacrylate)	30 wt%	Sol-gel (@ 50.7-61.3)	176

[C ₂ mim][BF ₄]	Poly(ethylene oxide) 20 kDa	2 wt%	LCST (@ 163)	191
[C ₂ mim][BF ₄]	Poly(ethylene oxide) 2 kDa	60 wt%	LCST (~ 155)	178
[C ₂ mim][BF ₄]	Poly(<i>N</i> -isopropylacrylamide) 40 kDa	1 wt%	UCST (@ 222)	177
[C ₄ mim][BF ₄]	Poly(ethylene oxide) 20 kDa	2 wt%	LCST (@ 209)	191
[C ₄ mim][BF ₄]	Poly(<i>N</i> -isopropylacrylamide)	1 wt%	UCST (@ 67)	177
[C ₄ mim][BF ₄]	Poly(ethylene oxide)- <i>b</i> -poly(<i>N</i> -isopropylacrylamide)	1 wt%	UCMT (~ 60) LCMT (~ 207)	177
[C ₂ dmim][BF ₄]	Poly(ethylene oxide) 2 kDa	60 wt%	LCST (~ 110)	178
[C ₄ mim][PF ₆]	Poly(<i>trans</i> -4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)- <i>b</i> -poly(ethylene oxide)- <i>b</i> -poly(<i>trans</i> -4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	1 wt%	UCMT (@ 60)	179
[C ₄ mim][PF ₆]	Poly(<i>trans</i> -4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)- <i>b</i> -poly(ethylene oxide)- <i>b</i> -poly(<i>trans</i> -4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	10 wt%	Sol-gel (@ 56)	179
[C ₄ mim][PF ₆]	Poly(<i>cis</i> -4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)- <i>b</i> -poly(ethylene oxide)- <i>b</i> -poly(<i>cis</i> -4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	1 wt%	UCMT (@ 44)	179
[C ₄ mim][PF ₆]	Poly(<i>cis</i> -4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)- <i>b</i> -poly(ethylene oxide)- <i>b</i> -poly(<i>cis</i> -4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	10 wt%	Sol-gel (@ 48)	179
[C ₄ mim][PF ₆]	Poly(4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)- <i>b</i> -poly(ethylene oxide)- <i>b</i> -poly(4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	20 wt%	Sol-gel (@ 47-55)	193
[C ₄ mim][PF ₆]	Poly(4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)- <i>b</i> -poly(ethylene oxide)- <i>b</i> -poly(4-phenylazophenyl methacrylate- <i>r</i> - <i>N</i> -isopropylacrylamide)	20 wt%	Sol-gel (@ 37-45)	194
[C ₄ mim][PF ₆]	Poly(glycidyl methyl ether)	10 wt%	LCST (@ 53.5)	173
[C ₄ mim][PF ₆]	Poly(ethoxyethyl glycidyl ether)	10 wt%	LCST (@ 56.0)	173
[C ₄ mim][PF ₆]	Poly(ethyl glycidyl ether)- <i>b</i> -poly(ethylene oxide)	1 wt%	LCMT (@ 15)	180
[C ₈ mim][PF ₆]	Poly(ethyl glycidyl ether)	10 wt%	LCST (@ 67.0)	173

Table S9. Overview of polymers exhibiting a thermoresponsive behaviour in other organic solvents in order of polarity.

Solvent	Type of polymer	Polymer conc	Phase transition type (Temp °C)	Ref
Diethyl ether	Poly(octadecyl vinyl ether)	1 wt%	UCST (~12)	109
Diethyl ether	Poly(hexadecyl vinyl ether)	1 wt%	UCST (ND)	109
THF	Poly(octadecyl vinyl ether)	1 wt%	UCST (ND)	147
THF	Poly(octadecyl vinyl ether)	1 wt%	UCST (~7)	109
THF	Poly[2-(4,4,5,5,6,6,7,7,7-nonafluoroheptyloxy)ethyl vinyl ether]	1 wt%	UCST (~8)	153
THF/BuOH	Poly[2-(vinylxy)-ethyl-1-butylimidazolium chloride]	1 wt%	LCST (~40)	155
THF/hexane	Poly(2-chloroethyl vinyl ether- <i>alt</i> -maleic anhydride)	0.1 wt%	LCST (~ 25)	149
THF/hexane	Poly(2-chloroethyl vinyl ether- <i>alt</i> -maleic anhydride)	0.02-7 wt%	LCST	207
THF	Hyperbranched 3-ethyl-3-(hydroxymethyl)oxetane core/glycidyl- <i>graft</i> -PEG shell copolymers	5 mg mL ⁻¹	UCST (@13.4-17.4)	199
THF	Poly(4-acryloylmorpholine)	6 wt%	UCST (~ 15)	200
THF	Poly(<i>N,N</i> -diethylacrylamide)- <i>b</i> -poly(4-acryloylmorpholine)	6 wt%	UCST (~ 20-40)	200

THF	Poly-(<i>p</i> -biphenylmethyl-L-glutamate	0.62-1.12 mg mL ⁻¹	Chiral optical transition (~-2.5)	201
TF	Poly- γ - <i>p</i> -biphenylethoxy-L-glutamate and poly- γ - <i>p</i> -biphenylhexoxy-L-glutamate	~ 20 wt%	α -helix reorientation (~ 7-37) gelation (~-9-39)	202
THF	Poly(styrene)	5 mg mL ⁻¹	ND	148
THF	Star poly(styrene)	5 mg mL ⁻¹	ND	148
1,4-Dioxane	Poly(11-(4-((<i>E</i>)-4-butylstyryl)phenoxy)undecyl methacrylate)	2 wt%	UCST (@ 52.3)	140
Methyl acetate	Polystyrene	0.003-0.078 wt%	LCST (@124.55-129.35) and UCST (@26.10-32.70)	21
Ethyl acetate	Polystyrene	0.005-0.489 wt%	LCST (@147.2-199.2)	21
Ethyl acetate	Poly(dodecyl vinyl ether)	1 wt%	UCST (~45)	109
Ethyl acetate	Poly(hexadecyl vinyl ether)	1 wt%	UCST (ND)	109
Ethyl acetate	Poly(cholesteryl 2-(vinylxy)ethyl carbonate)	1 wt%	UCST (@67)	109
Ethyl acetate	Poly(octadecyl vinyl ether- <i>random</i> -isobutyl vinyl ether)	1 wt%	UCST (~15)	109
Ethyl acetate/BuOH	Poly[2-(vinylxy)-ethyl-1-butylimidazolium chloride]	1 wt%	LCST (~65)	155
<i>n</i> -Butyl acetate	Poly(2-chloroethyl vinyl ether- <i>alt</i> -maleic anhydride)	0.05 wt%	LCST (~85)	203
<i>Tert</i> -butyl acetate	Polystyrene	0.005-0.3 wt%	LCST (@117.9-165.5) and UCST (@ -32.5-5.5)	21
Propyl acetate/DCE	Poly(2-chloroethyl vinyl ether- <i>alt</i> -maleic anhydride)	0.1 wt%	LCST (~42-70)	149
DME	Poly-(methacrylic acid- <i>alt</i> -hydroxyethyl acrylate)	8 mg mL ⁻¹	LCST (~18)	204
DME	Poly(methacrylic acid)	8 mg mL ⁻¹	LCST (~25)	208
DME	Poly(arylene ether sulfone)	2.5 mg mL ⁻¹	LCST (@37)	163
DME	poly(arylene ether sulfonate)- <i>b</i> -polylactide	15 mg mL ⁻¹	LCST (@27.4)	163
Acetone	Poly(octadecyl vinyl ether- <i>random</i> -isobutyl vinyl ether)	1 wt%	UCST (~38)	109
Acetone	Poly[2-(4,4,5,5,6,6,7,7,7-nonafluoroheptyloxy)ethyl vinyl ether]	1 wt%	UCST (~14)	153
DMF	Comb-like copolymer of <i>N</i> -phenyl maleimide and <i>n</i> -octadecyl vinyl ether	1 wt%	UCST (@51)	117
DMF	4,4'-sulfonyldiphenol (SDP) based oligourethane derivative based on 1,6-hexamethylene diisocyanate	8 wt%	Sol-gel transition (@63°C)	206
DMF	4,4'-sulfonyldiphenol (SDP)-based oligourethane derivative based on 4,4'-methylenebis(cyclohexyl isocyanate)	8 wt%	Sol-gel transition (ND)	206
DMF	4,4'-sulfonyldiphenol (SDP) based oligourethane derivative based on 2,4-diisocyanatotoluene	8wt%	Sol-gel transition (ND)	206
DMF	Poly(thioether)- <i>b</i> -polysiloxane- <i>b</i> -furfuryl poly(thioether)-bismaleimide elastomer	n/a	De-crosslinking (@ 150)	205
DMAc	Poly(styrene)	5 mg mL ⁻¹	ND	148
DMAc	Star poly(styrene)	5 mg mL ⁻¹	ND	148
DMAc	4,4'-sulfonyldiphenol (SDP) based oligourethane derivative based on 1,6-hexamethylene diisocyanate	8 wt%	Sol-gel transition (ND)	206
DMAc	4,4'-sulfonyldiphenol (SDP)-based oligourethane derivative based on 4,4'-methylenebis(cyclohexyl isocyanate)	8 wt%	Sol-gel transition (ND)	206
DMAc	4,4'-sulfonyldiphenol (SDP) based oligourethane derivative based on 2,4-diisocyanatotoluene	8 wt%	Sol-gel transition (ND)	206
DMSO	4,4'-sulfonyldiphenol (SDP) based oligourethane derivative based on 1,6-hexamethylene diisocyanate	8 wt%	Sol-gel transition (ND)	206
DMSO	4,4'-sulfonyldiphenol (SDP)-based oligourethane derivative based on 4,4'-methylenebis(cyclohexyl isocyanate)	8 wt%	Sol-gel transition (ND)	206

DMSO	4,4'-sulfonyldiphenol (SDP) based oligourethane derivative based on 2,4-diisocyanatotoluene	8 wt%	Sol-gel transition (ND)	206
ACN	Poly(3-(3-butylureido)propyl acrylate- <i>star-N</i> -[3-(acryloyloxy)propyl]- <i>N,N,N</i> -trihexammonium tetrakis(3,5-bis(trifluoromethyl)phenyl)borate	100 mg mL ⁻¹	UCST (@57)	164
ACN	Polysiloxanes of poly(aminopropylmethylsiloxane) and <i>N</i> -isopropyl acrylamide	10 mg mL ⁻¹	UCST (@36.2-62.7)	96