Supporting information:

Ethyl acetate as solvent for the synthesis of poly(2-ethyl-2-oxazoline)

Maarten Vergaelen,[a] Bart Verbraeken,[a] Joachim F. R. Van Guyse,[a] Annelore Podevyn, [a] Ali Tigrine,[a] Victor R. de la Rosa[a], Bryn D. Monnery[a, b] and Richard Hoogenboom[a,*]

[a.] *Supramolecular Chemistry Group, Centre of Macromolecular Chemistry (CMaC), Department of Organic and Macromolecular Chemistry, Ghent University, Krijgslaan 281-S4, 9000 Ghent, Belgium; *Richard.Hoogenboom@ugent.be.*

[b.] *Polymer Reaction Design Group, Department of Organic and Bio- Polymer Chemistry, Hasselt University, Agoralaan Gebouw D, 3590, Belgium*

This supporting information document includes the tables from the experimental part depicted in the article entitled, Ethyl acetate as green solvent for the synthesis of poly(2-ethyl-2-oxazoline).

SI Table 1: Reprint of table 5 from ref 1 including highlighted solvents ranked according to recommendation in medical products and the possibility to retract the solvent from renewable sources. Reprinted with permission from ref 1.

Table 5 A modified version of the conclusion to the survey of solvent selection guides [57]

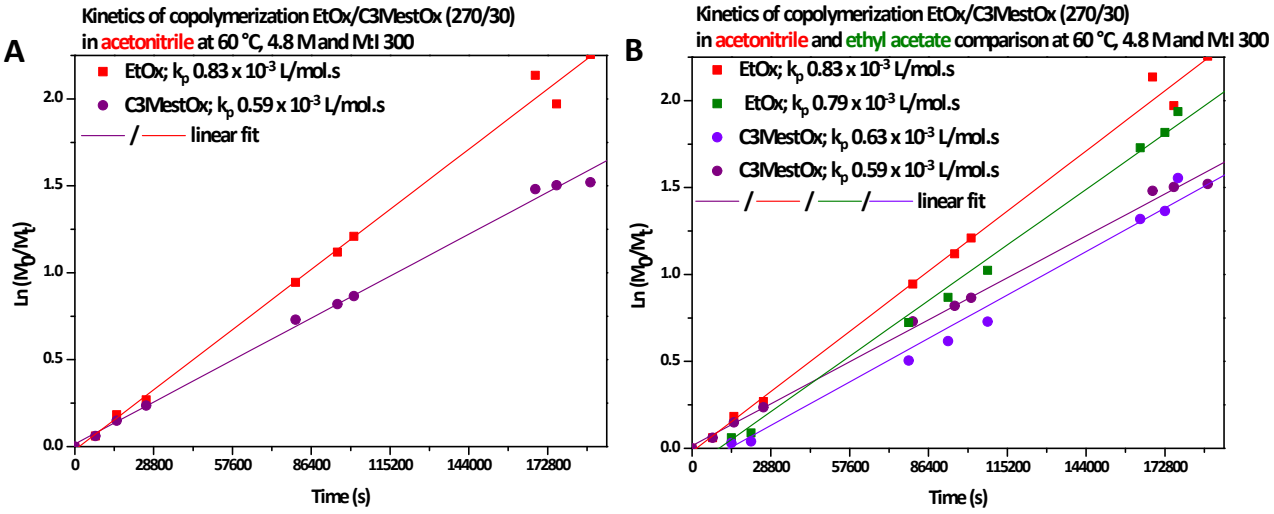
Category	Bio-based	Can be sourced renewably	Potential biomass feedstock	Not bio-based
Recommended	Ethanol (4)[a] Water	1-Butanol Ethyl acetate (2)[a]	1-Butyl acetate Isopropanol (1)[a] Isopropyl acetate	Anisole Sulpholane
Inbetween recommended and problematic		Acetic acid (9)[a] Acetone Ethylene glycol Methanol (3)[a]	Acetic anhydride *t*-Butanol Methyl acetate MIBK	Benzyl alcohol Cyclohexanone MEK
Problematic	DMSO {12 %}[b] 2-MeTHF			Acetonitrile (10)[a] PhCl {2 %}[b] DMPU Heptane (5)[a] Methylcyclohexane Toluene (7)[a] Xylene(s)
Inbetween problematic and hazardous		THF (6)[a]	Formic acid TBME	Cyclohexane DCM (8)[a] {48 %}[b] Pyridine
Hazardous		Triethylamine	1,4-Dioxane {0 %}[b] 1,2-DME {6 %}[b] DMAc {12 %}[b] DMF {31 %}[b] Methoxyethanol NMP {9 %}[b]	Diisopropyl ether {7 %}[b] *n*-Hexane {14 %}[b] Pentane
Highly hazardous			Diethyl ether {3 %}[b]	Benzene Chloroform {2 %}[b] Carbon tetrachloride 1,2-DCE {4 %}[b] Nitromethane

[a] The ranking of the top ten solvents used by GSK in pilot plant operations in 2005 have been provided in parentheses, excluding water [7]

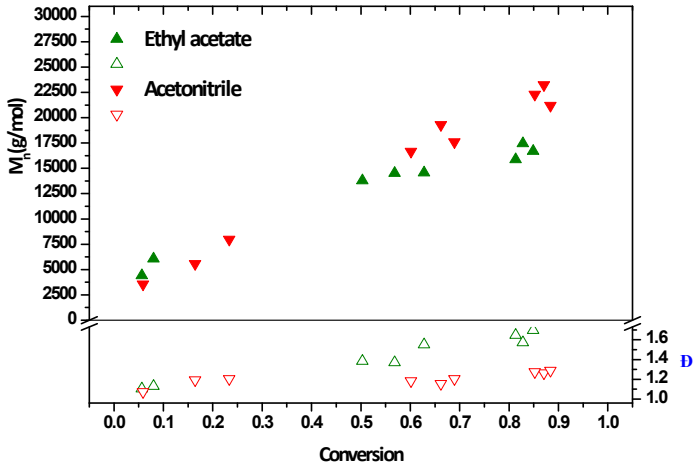
[b] Usage of solvents of concern and dipolar aprotic solvents as reported in *Organic Process Research and Development* between 1997 and 2012, presented as the percentage of papers containing reactions performed in each solvent [8]. Data is not available for greener solvents

SI Table 2: Calculations for the kinetic study for the homopolymerization of EtOx in different solvents.

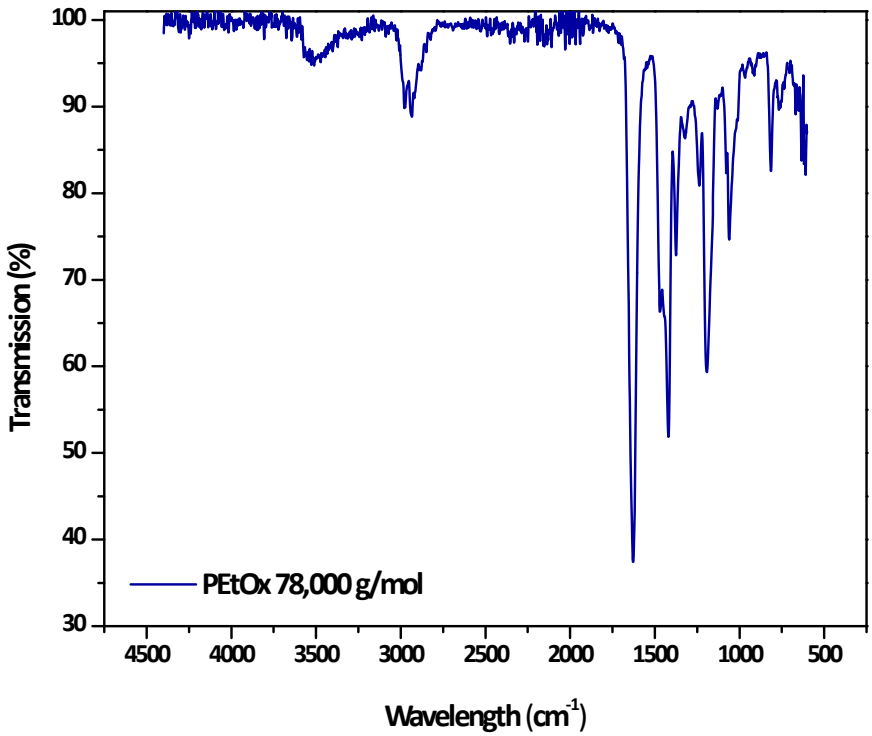
M	[M]/[I]	[M]	$V_{stock,tot}$	[I]	Vol (I)	Vol (M)	V(s)
name	**ratio**	**mol/L**	**mL**	**mol/L**	**mL**	**mL**	**mL**
EtOx	100	3	45	0.03	0.210	13.7	31.1



SI Figure 1. Copolymerization kinetic data plots for the CROP of EtOx and C3MestOx in acetonitrile (**A**) and the combined first order kinetic plot for the copolymerization CROP of EtOx and C3MestOx in acetonitrile and C3MestOx giving similar k_p's (**B**).



SI Figure 2. SEC data for the copolymerization kinetics of EtOx and C3MestOx in acetonitrile (red) and ethyl acetate (green) shown in a number average molecular weight (M_n) versus conversion plot, including the molar mass distribution data, dispersity (Đ).



SI Figure 3. IR spectrum of the purified 78,000 g/mol PEtOx polymer synthesized according the method described in the experimental part of the manuscript.

SI Table 3: Calculations for the kinetic study for the copolymerization of EtOx and C3MestOx in ethyl acetate and acetonitrile at 60 °C. M = monomer, I = initiator, s = solvent.

M	**[M]/[I]**	**Total [M]**	**$V_{stock,tot}$**	**[I]**	**Vol (I)**	**Vol (M1:M2)**	**V(s)**
name	**ratio**	**mol/L**	**mL**	**mol/L**	**mL**	**mL**	**mL**
EtOx (M1): C3MestOx(M2)	270:30	4.8	12	0.016	0.112	5.23 : 0.86	5.91

SI references

1 F. P. Byrne, S. Jin, G. Paggiola, T. H. M. Petchey, J. H. Clark, T. J. Farmer, A. J. Hunt, C. Robert McElroy and J. Sherwood, *Sustain. Chem. Process.*, 2016, **4**, 7.