

Appendix A. Supplementary Information

Section 1. Summary of the experiments with KIP-321_p as catalyst.

There were 26 runs for the reaction with KIP-321_p catalyst with variations in stirring speed (Exp1-3), catalyst loading (Exp 2,4-5,11-13,19-21), feed mole ratios (FMRs, Exp 2,6-7;13-15;20,22-23) and temperature (Exp 2,8-10;13,16-18;20,24-26), given in Table S.1.

Table S. 1. Summary of the experiments with KIP321_p as catalyst.

Exp Run number	Temperature (K)	Catalyst Loading(wt.%)	Stirring speed(rpm)	FMRs
1	373.15	4	300	DMC:EG=1:1
2	373.15	4	600	DMC:EG=1:1
3	373.15	4	900	DMC:EG=1:1
4	373.15	1	600	DMC:EG=1:1
5	373.15	2	600	DMC:EG=1:1
6	373.15	4	600	DMC:EG=2:1
7	373.15	4	600	DMC:EG=1:2
8	333.15	4	600	DMC:EG=1:1
9	353.15	4	600	DMC:EG=1:1
10	393.15	4	600	DMC:EG=1:1
11	373.15	1	600	DMC:1,2-BDO=1:1
12	373.15	2	600	DMC:1,2-BDO=1:1
13	373.15	4	600	DMC:1,2-BDO=1:1
14	373.15	4	600	DMC:1,2-BDO=2:1
15	373.15	4	600	DMC:1,2-BDO=1:2
16	333.15	4	600	DMC:1,2-BDO=1:1
17	353.15	4	600	DMC:1,2-BDO=1:1
18	393.15	4	600	DMC:1,2-BDO=1:1
19	373.15	0.5	600	EC:1,2-BDO=1:1
20	373.15	1	600	EC:1,2-BDO=1:1
21	373.15	4	600	EC:1,2-BDO=1:1
22	373.15	1	600	EC:1,2-BDO=2:1
23	373.15	1	600	EC:1,2-BDO=1:2
24	333.15	1	600	EC:1,2-BDO=1:1
25	353.15	1	600	EC:1,2-BDO=1:1
26	393.15	1	600	EC:1,2-BDO=1:1

Table S. 2 Rate constants and equilibrium constants of the transesterification reaction.

Exp Run number	Kf ⁺ mol/(s·g _{cat})	Kf ⁻ mol/(s·g _{cat})	Keq	Sum of squares of errors×10 ⁴
1				
2	8.00×10 ⁻⁵	3.60×10 ⁻⁵	2.22	0.47
3				
4	1.69×10 ⁻⁴	7.61×10 ⁻⁵		0.18
5	1.16×10 ⁻⁴	5.21×10 ⁻⁵		0.47
6	7.24×10 ⁻⁵	3.36×10 ⁻⁵	2.15	0.22
7	8.75×10 ⁻⁵	4.19×10 ⁻⁵	2.08	0.48
8	4.30×10 ⁻⁶	2.53×10 ⁻⁶	1.70	0.07
9	1.57×10 ⁻⁵	8.17×10 ⁻⁶	1.92	1.19
10	2.48×10 ⁻⁴	9.83×10 ⁻⁵	2.52	0.08
11	1.36×10 ⁻⁴	1.65×10 ⁻⁵		0.11
12	7.55×10 ⁻⁵	9.19×10 ⁻⁶		0.71
13	4.20×10 ⁻⁵	5.11×10 ⁻⁶	8.21	0.35
14	3.68×10 ⁻⁵	4.59×10 ⁻⁶	8.05	0.79
15	5.96×10 ⁻⁵	7.22×10 ⁻⁶	8.26	2.85
16	2.76×10 ⁻⁶	4.76×10 ⁻⁷	5.80	0.16
17	9.34×10 ⁻⁶	1.34×10 ⁻⁶	6.98	1.12
18	1.27×10 ⁻⁴	1.29×10 ⁻⁵	9.87	0.32
19	1.26×10 ⁻³	1.56×10 ⁻⁴		0.33
20	9.54×10 ⁻⁴	9.94×10 ⁻⁵	9.60	1.75
21	6.24×10 ⁻⁴	6.56×10 ⁻⁵		0.84
22	2.27×10 ⁻³	2.76×10 ⁻⁴	9.21	0.13
23	1.15×10 ⁻³	1.24×10 ⁻⁴	9.25	1.85
24	1.04×10 ⁻⁴	1.15×10 ⁻⁵	8.99	0.21
25	2.70×10 ⁻⁴	2.86×10 ⁻⁵	9.44	0.10
26	2.94×10 ⁻³	3.00×10 ⁻⁴	9.81	3.62