Supplementary Materials

SILP materials as effective catalysts in selective monofunctionalization of 1,1,3,3- tetramethyldisiloxane

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[1]H NMR data for obtained ionic liquids:

[P_{8888}][NTf_2]:

[1]H NMR (300 MHz, DMSO): 2.17 (6H,m, P-CH_2-), 2.17 (8H,t, P-CH_{2k}), 1.27-1.47 (48H,m,-(CH_2)$_6$-), 0.87 (12H, t, -CH_3)

[P_{66614}][NTf_2]:

[1]H NMR (300 MHz, DMSO): 2.18 (8H, t, P-CH_2-), 1.25-1.50 (48H, m, -(CH_2)$_{n-}$), 0.86-0.92 (12H, t, -CH_3)

[P_{4441}][NTf_2]:

[1]H NMR: (300 MHz, DMSO): 2.17 (6H, m, P-CH_2-), 1.80 (3H, s, P-CH_3), 1.43 (12H, m, -CH_2-CH_2-), 0.92 (9H, t, -CH_3)

IC analysis of Ionic Liquids

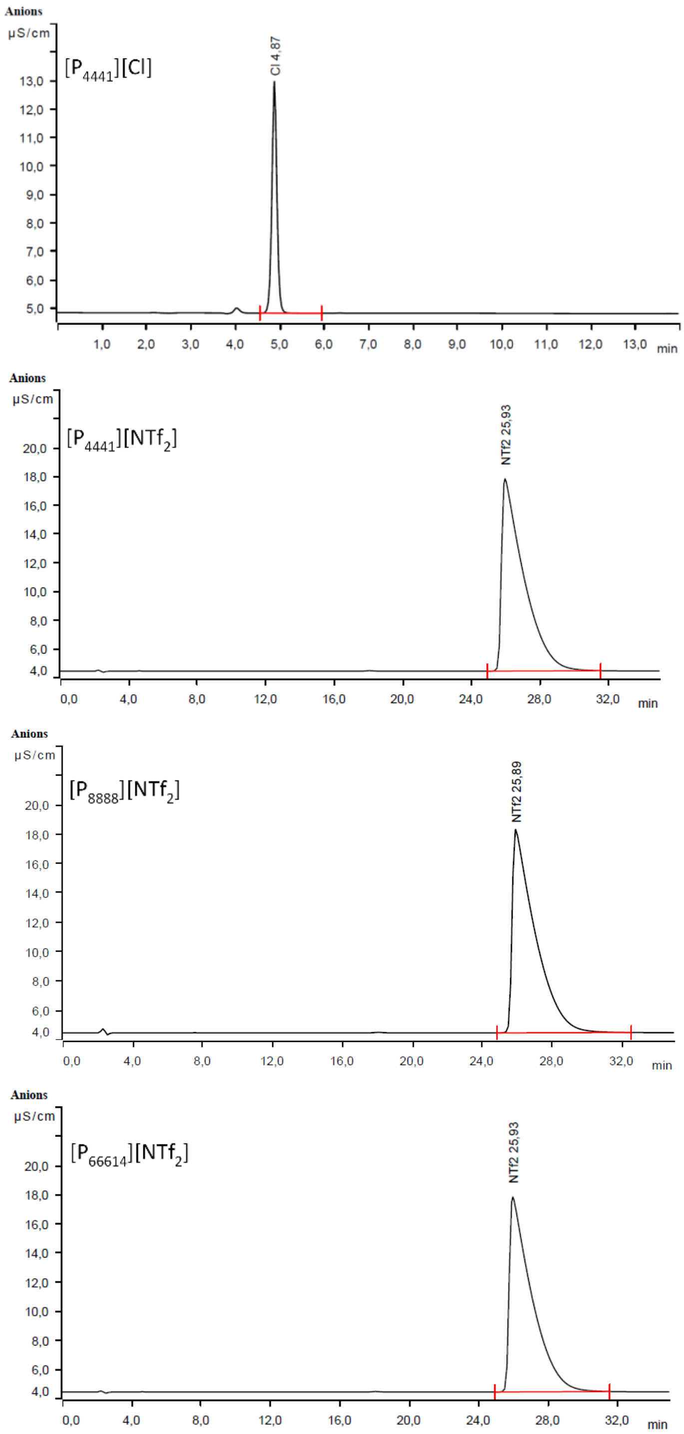

Figure S1. IC chromatograms of synthesized ILs with $[NTf_2]^-$ anion from their chloride precursors. No peak observance at ~4.9 min means that $[Cl]^-$ content in ionic liquid is below limit of detection.

GC-MS chromatograms

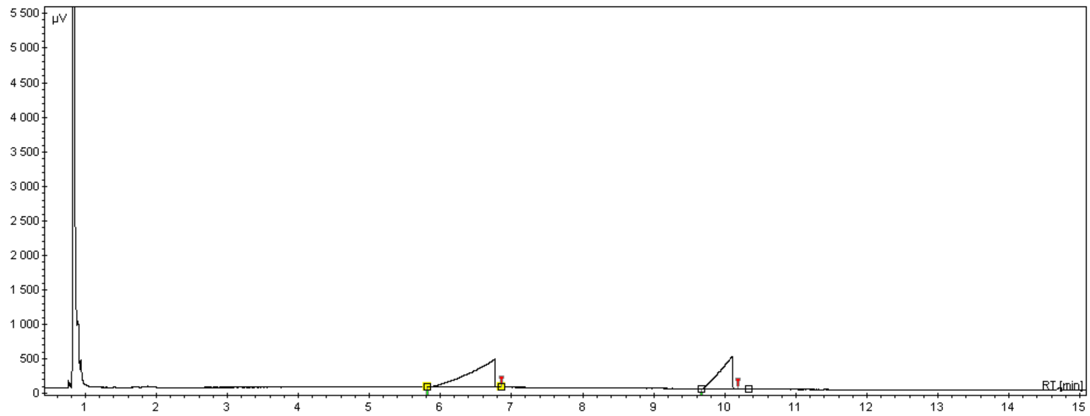

Figure S2. GC chromatogram of post reaction mixture obtained from reaction using SILP **(A1)** after 1st reaction cycle; retention times 0.9 min – acetone, 1.5-2.0 min – substrates (1-octene, TMDSO), 6.7 min – decane (internal standard), 10.1 min – product A (octylotetramethyldisiloxane)

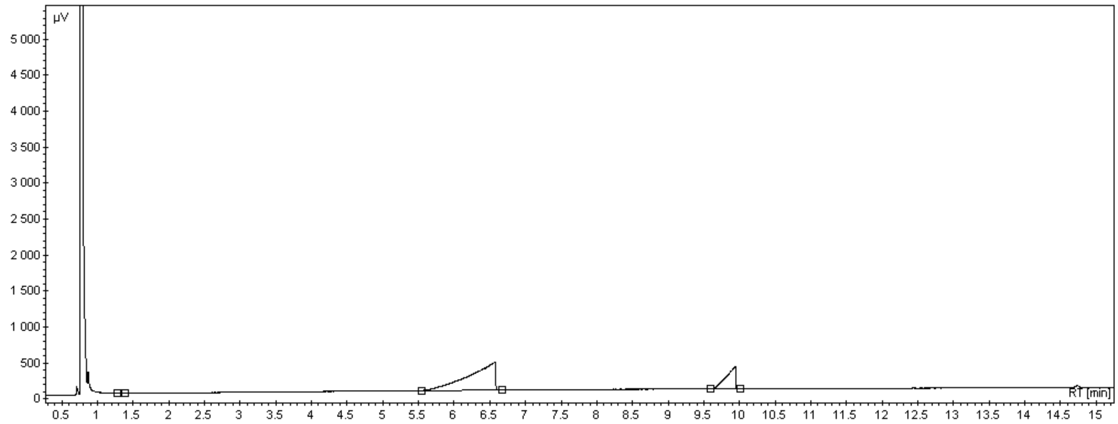

Figure S3. GC chromatogram of post reaction mixture obtained from reaction using SILP **(B1)** after 1st reaction cycle; retention times 0.9 min – acetone, 1.5-2.0 min – substrates (1-octene, TMDSO), 6.7 min – decane (internal standard), 10.1 min – product A (octylotetramethyldisiloxane)

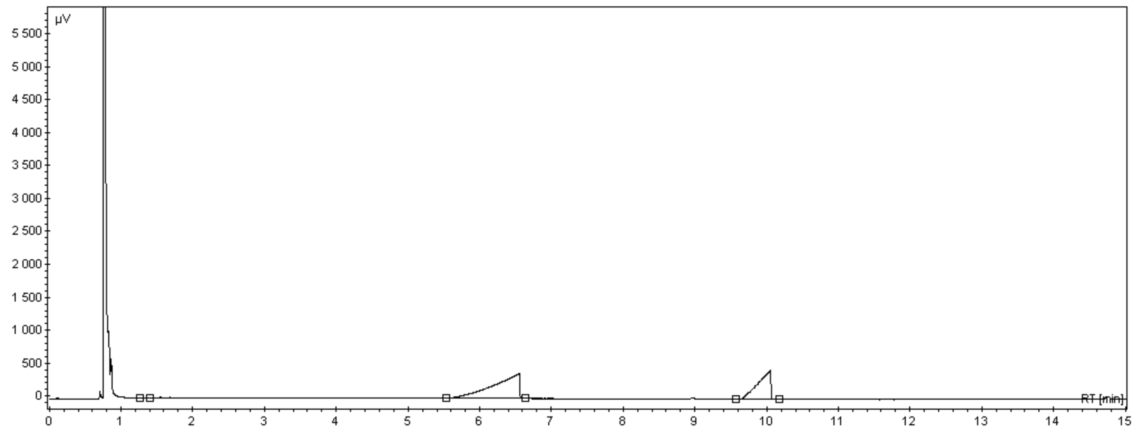

Figure S4. GC chromatogram of post reaction mixture obtained from reaction using SILP **(C1)** after 1st reaction cycle; retention times 0.9 min – acetone, 1.5-2.0 min – substrates (1-octene, TMDSO), 6.7 min – decane (internal standard), 10.1 min – product A (octylotetramethyldisiloxane)

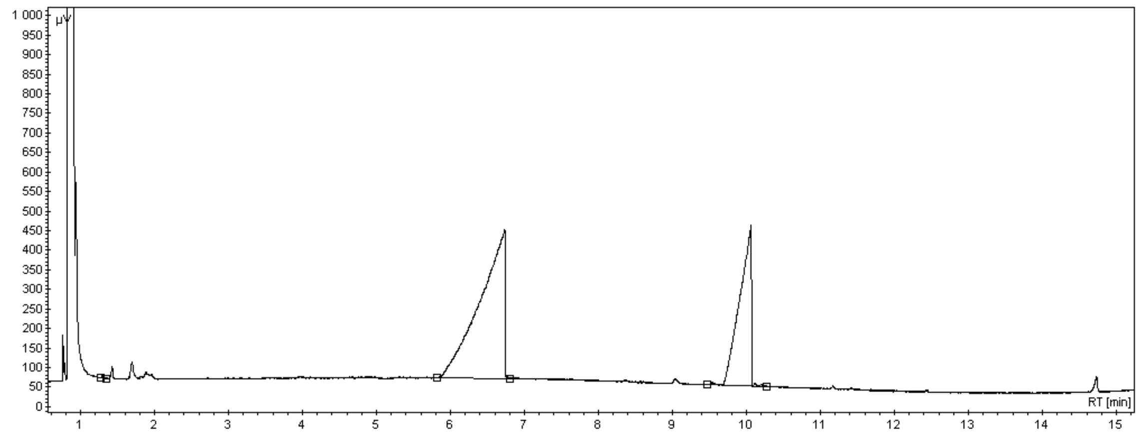

Figure S5. Example of GC chromatogram of post reaction mixture obtained from reaction using SILP **(C1)** after 4st reaction cycle; retention times 0.9 min – acetone, 1.5-2.0 min – substrates (1-octene, TMDSO), 6.7 min – decane (internal standard), 10.1 min – product A (octylotetramethyldisiloxane), 14.7 min – product B (1,3-dioctylo-1,1,3,3-tetramethyldisiloxane)

GC-MS mass spectrum

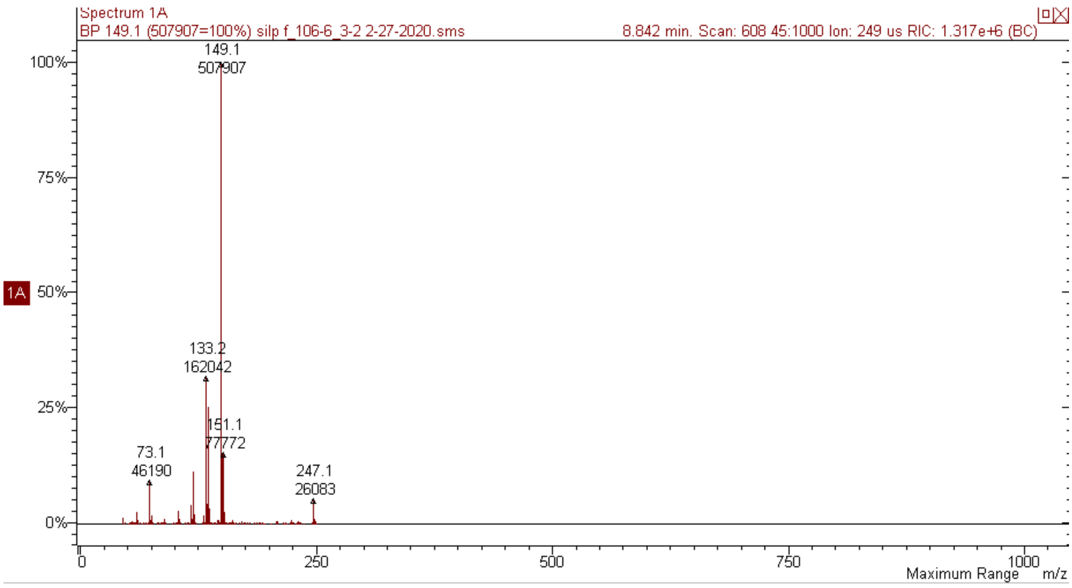

Figure S6. GC-MS mass spectrum of octylotetramethyldisiloxane obtained from reaction using SILP **(A1)** recorded at retention time 8.842 min.

MS (ESI): m/z (%) = 247 ($[M+H]^+$,5); 149 ($[Si(CH_3)_3)_2O_2)]^+$ 100); 133 ($[Si(CH_3)_3)_2O)]^+$ 32); 73 ($[Si(CH_3)_3]^+$ 9)

Conversion and selectivity of hydrosilylation reaction using SILP materials

Table S1. Conversion and selectivity of hydrosilylation reaction using SILP materials ($[RhCl(PPh_3)_3]$).

Cycle number	Catalyst (A1)						Catalyst (B1)						Catalyst (C1)					
	$x^a=10^{-5}$		$x^a=10^{-6}$		$x^a=10^{-7}$		$x^a=10^{-5}$		$x^a=10^{-6}$		$x^a=10^{-7}$		$x^a=10^{-5}$		$x^a=10^{-6}$		$x^a=10^{-7}$	
	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]
1	>99	100	>99	100	>99	100	>99	98	>99	97	64	100	>99	99	>99	97	32	100
2	>99	100	>99	100	62	100	>99	98	>99	97	52	100	>99	99	>99	97	11	100
3	>99	100	>99	100	22	100	>99	98	>99	97	44	100	>99	99	>99	97	3	100
4	>99	100	>99	100	11	100	>99	98	61	100	9	100	>99	99	91	97		
5	>99	100	>99	100	3	100	86	98	84	100			>99	99	80	97		
6	>99	100	79	100			70	98	77	100			>99	97	64	96		
7	>99	100	53	100			68	97	46	100			>99	98	48	95		
8	>99	100	28	100			62	97	60	100			>99	98	46	95		
9	>99	100	15	100			54	97	24	100			>99	97	32	95		
10	>99	100					51	97					>99	98	58	95		
11	>99	100											>99	96				
12	>99	100											>99	97				
13	>99	100											>99	98				
14	>99	100											>99	97				
15	>99	100											98	97				
16	>99	100											98	94				
17	95	100											98	97				
18	82	100											96	97				
19	61	100											92	97				
20	39	100											90	97				
TOF [h^{-1} x10^3]	3722		1340		394		1574		1496		536		3916		1432		92	

[1] conversion (C); [2]selectivity (S); [a] Molar ratio TMDSO:1-oct:[Rh] 2:1:2x10^x

Table S2. Conversion and selectivity of hydrosilylation reaction using SILP materials ($[\{Rh(\mu\text{-}OSiMe_3)(cod)\}_2]$).

Cycle number	Catalyst (A2)						Catalyst (B2)						Catalyst (C2)					
	$x^a=10^{-5}$		$x^a=10^{-6}$		$x^a=10^{-7}$		$x^a=10^{-5}$		$x^a=10^{-6}$		$x^a=10^{-7}$		$x^a=10^{-5}$		$x^a=10^{-6}$		$x^a=10^{-7}$	
	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]
1	>99	99	>99	100	26	100	>99	99	>99	97	100	100	>99	98	>99	100	>99	98
2	>99	100	>99	100	0		>99	99	>99	97	7	100	>99	98	>99	100	56	99
3	>99	100	>99	100			>99	99	>99	97			>99	98	>99	100		
4	>99	100	>99	100			>99	99	95	97			>99	98	>99	100		
5	>99	100	32	100			>99	99	81	98			>99	98	>99	100		
6	>99	100					>99	98	37				>99	98	>99	100		
7	>99	100					>99	99	28				>99	98	53	100		
8	>99	99					>99	99	19				>99	98	46	100		
9	90	99					>99	99	10				>99	98	32	100		
10	85	99					>99	98	9				>99	98	24	100		
11	77	100					>99	100					>99	98				
12	61	100					>99	100					>99	98				
13	52	100					>99	100					>99	98				
14	35	100					73	100					>99	98				
15	15	100					26	100					>99	98				
16													>99	98				
17													>99	98				
18													>99	98				
19													>99	98				
20													>99	97				
TOF [h^{-1} x10^3]	2414		856		52		2772		1152		214		3960		1498		310	

[1] conversion (C); [2] selectivity (S); [a] Molar ratio TMDSO:1-oct:[Rh] 2:1:2x10^x

Table S3. Conversion and selectivity of hydrosilylation reaction using SILP materials [{RhCl(cod)}$_2$].

Cycle number	**Catalyst (A3)**						**Catalyst (B3)**						**Catalyst (C3)**					
	x[a]=10^{-5}		x[a]=10^{-6}		x[a]=10^{-7}		x[a]=10^{-5}		x[a]=10^{-6}		x[a]=10^{-7}		x[a]=10^{-5}		x[a]=10^{-6}		x[a]=10^{-7}	
	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]	C[1]	S[2]
1	>99	98	>99	98	10	100	>99	98	79	97	12	100	>99	99	>99	99	99	97
2	>99	98	>99	98	0	0	>99	98	73	97	0		>99	98	>99	100	63	100
3	>99	98	>99	98			>99	98	77	97			>99	97	>99	100	28	100
4	>99	98	>99	97			>99	98	71	97			>99	96	>99	100	5	100
5	>99	98	>99	97			>99	98	65	97			>99	94	>99	100		
6	>99	98	>99	97			>99	98	58	96			>99	97	>99	100		
7	>99	98	>99	97			>99	97	42	100			>99	98	>99	100		
8	>99	98	>99	97			>99	97	34	100			>99	98	>99	100		
9	>99	98	>99	97			>99	97	23	100			>99	98	99	100		
10	>99	98	>99	97			>99	97	18	100			>99	98	87	100		
11	>99	98	>99	97			>99	97					>99	98	55	97		
12	>99	98	>99	97			>99	97					>99	97	39	100		
13	>99	98	>99	97			>99	97					>99	97	38	100		
14	>99	98	>99	97			>99	97					>99	97	20	100		
15	>99	98	87	99			>99	97					>99	97	26	100		
16	>99	98	75	99			>99	99					>99	99				
17	>99	98	65	99			>99	99					>99	99				
18	>99	98	34	99			>99	99					>99	99				
19	>99	97					>99	99					>99	99				
20	>99	97					>99	99					>99	99				
TOF [h^{-1} x10^3]	3960		3294		20		3960		1080		24		3960		2312		390	

[1] conversion (C); [2]selectivity (S); [a] Molar ratio TMDSO:1-oct:[Rh] 2:1:2x10^x