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Ionic liquid tethered post functionalized ZIF-90 framework for the cycloaddition of propylene oxide and CO_2

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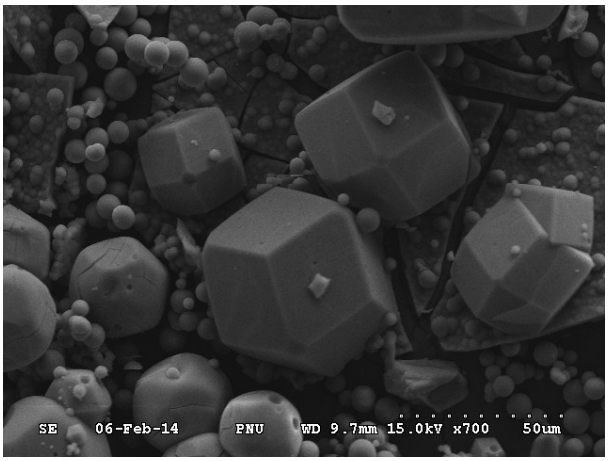

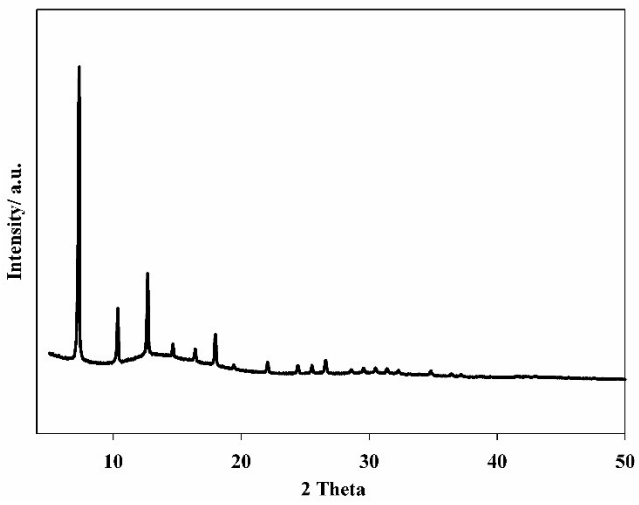

Fig. S1. SEM and XRD analysis of ZIF-90

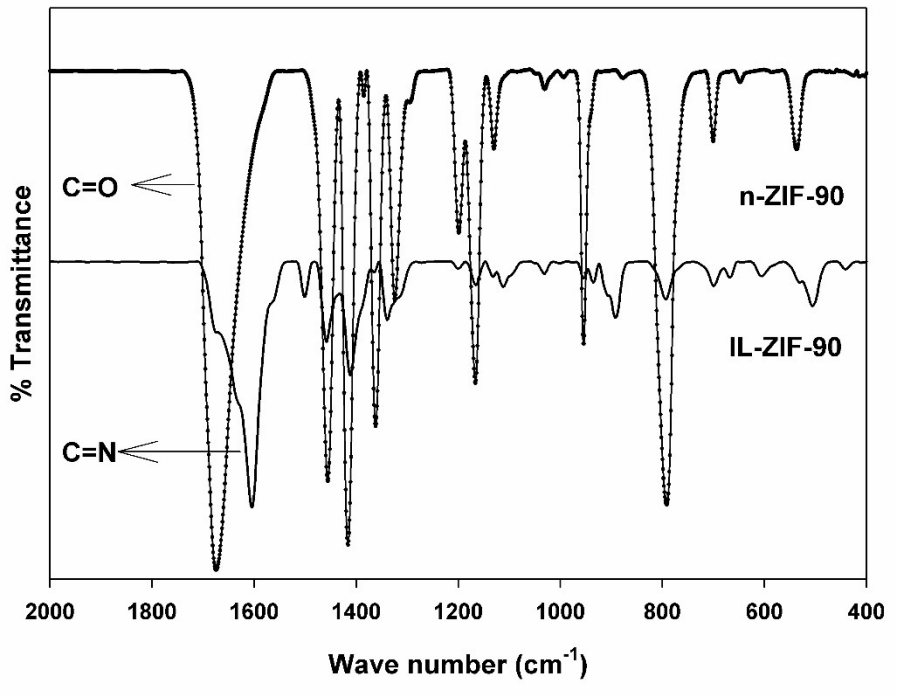

Fig. S2. FT-IR analysis of n-ZIF-90 and IL-ZIF-90

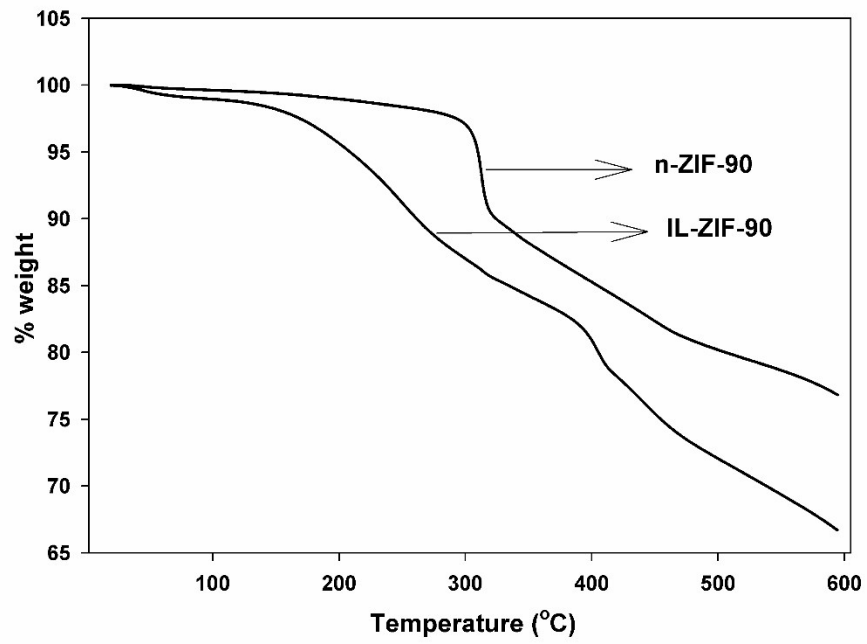

Fig. S3. TGA curves of n-ZIF-90 and IL-ZIF-90

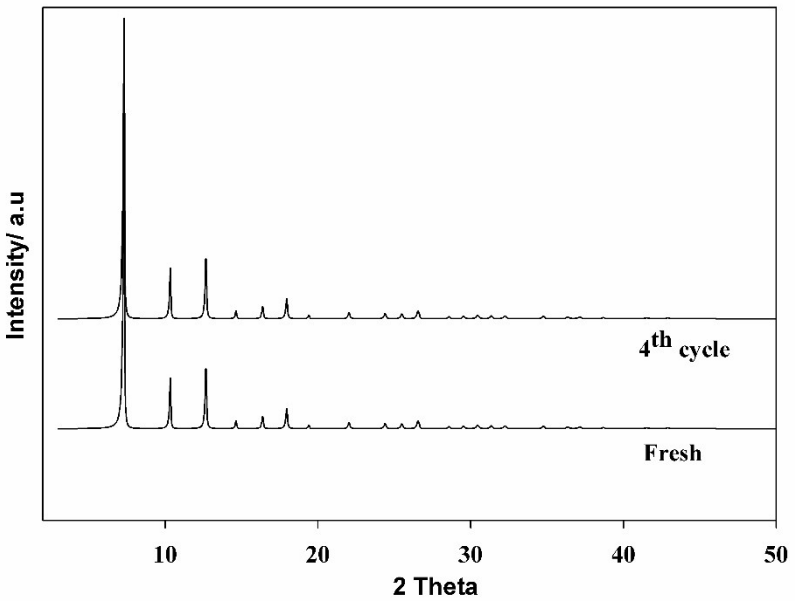

Fig. S4. XRD analysis of fresh and recycled IL-ZIF-90

Table S1. The amount of acidic and basic sites in ZIF-90 according to CO_2 and NH_3 TPD experiments

Catalyst	CO_2-TPD (mmol/g)			NH_3-TPD (mmol/g)		
	Weak base[a]	Strong base[b]	Total	Weak acid[c]	Strong acid[d]	Total
n-ZIF-90	6.17	79.20	85.37	0.30	1.84	2.14
IL-ZIF-90	8.30	30.81	39.11	0.91	0.40	1.31

[a] 351~470 K, [b] 470~553 K, [c] 358~474 K, [d] 474~551 K.

Table S2. Comparison of the catalytic activity of Il-ZIF-90 with the reported MOFs in the absence of co-catalyst.

Entry	Catalyst	Catalyst (mol%)	Reaction Conditions			Yield (%)	Reference
			Pressure (MPa)	Temperature (°C)	Time (h)		
1	MOF-5	2.5	6	50	4	0.1	1
2	MOF-5	2.5	6	90	2	0	2
3	MIXMOF	0.04	-	140	3	1	3
4	IRMOF-3	0.14	2	140	5	2	4
5	F-IR-MOF-3-4d	0.25	2	140	1.5	98	4
6	Ni(Salphen)-MOF	0.56	2	80	4	0	5
7	CMOF-1	0.69	2	25	4	0	6
8	CHB(M)	1.6	1.2	120	6	62	7
9	gea-MOF-1	0.15	2	120	6	6*	8
10	ZIF-90	0.59	1.2	120	8	81	9
11	n-ZIF-90	0.49	1	120	3	49	Present work
12	IL-ZIF-90	0.49	1	120	3	95	Present work

Reaction conditions: Epoxide = PO, *Conversion (%)

Reference

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