

## Enhancing the stability of Rh/ZnO catalyst by growth of ZIF-8 for hydroformylation of higher olefins

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Table S1 Hot filtration experiment results for different catalysts

Catalyst	Time (h)	Conv. (%)	Sel. (%)	
			Aldehyde	Iso-alkene
0.5%Rh/ZnO-C	1	68	51	49
0.5%Rh/ZnO-C <sup>a</sup>	4	97	99	1
0.5%Rh/ZnO <sub>50</sub>	1.5	52	54	46
0.5%Rh/ZnO <sub>50</sub> <sup>a</sup>	1.5	98	66	34
0.5%Rh/ZnO-S	1	55	57	43
0.5%Rh/ZnO-S <sup>a</sup>	4	95	93	7

Reaction condition: 4.0 MPa (CO/H<sub>2</sub>=1), 90 °C, 2.5 mmol 1-dodecene, 1.0 mmol 1-octanol as internal standard, 2 h, a refer to the continued reaction without catalyst.

Table S2 Concentration of loss Rh in different hot filtered solution

Catalyst	Loss of Rh (%)
0.5%Rh/ZnO-C	33.6
0.5%Rh/ZnO <sub>50</sub>	18.2
0.5%Rh/ZnO-S	35.2
0.5%Rh/ZnO <sub>50</sub> @ZIF-8	0.55

Table S3 Catalytic results of 0.5%Rh/ZnO<sub>50</sub>@ZIF-8 catalyst in other substrate.

Substrate	Conversion (%)	Selectivity (%)		L/B
		Aldehyde	Iso-olefin	
1-hexene	98.2	90.1	9.9	0.8
1-octene	99.4	87.5	12.5	1.2
1-decene	97.3	84.5	15.5	1.5

Reaction condition: 4.0 MPa (CO/H<sub>2</sub>=1), 90 °C, 2.5 mmol substrate, 1.0 mmol 1-octanol as internal standard, 4.5 h, L/B ratio refer to the ratio of linear to branched aldehyde in the products.

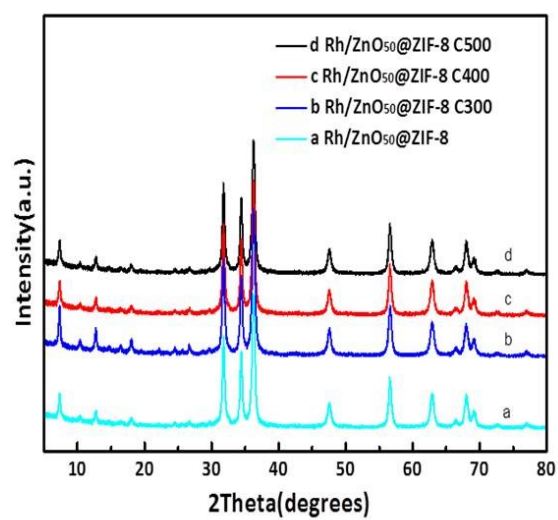


Fig. S1 XRD patterns of Rh/ZnO<sub>50</sub>@ZIF-8 treated at different temperatures

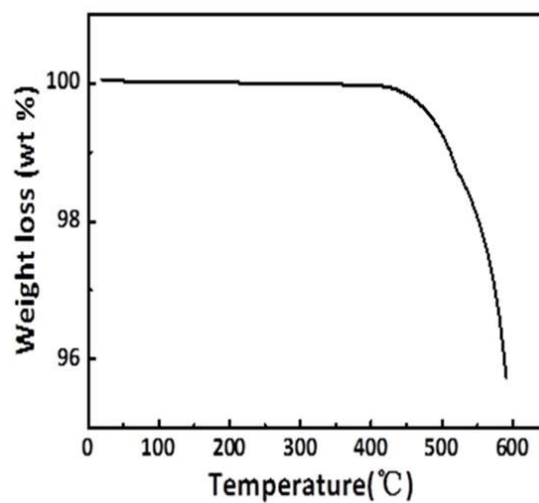


Fig. S2 TG curve of Rh/ZnO<sub>50</sub>@ZIF-8 catalyst

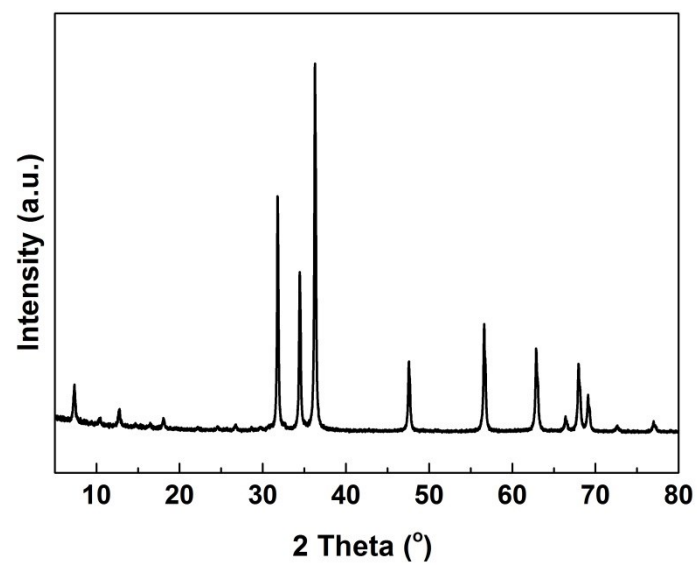


Fig. S3 XRD pattern of Rh/ZnO@ZIF-8 catalyst after cyclic experiment