Electronic Supplementary Material (ESI) for RSC Advances.

Synergism between Hierarchical MFI Zeolites and Alumina in Alkene Cross-Metathesis Reactions as a Function of Composition

Ning Wei,[abc] Weiping Zhang,[c,*] Dazhi Zhang[a] and Shengjun Huang[a,*]

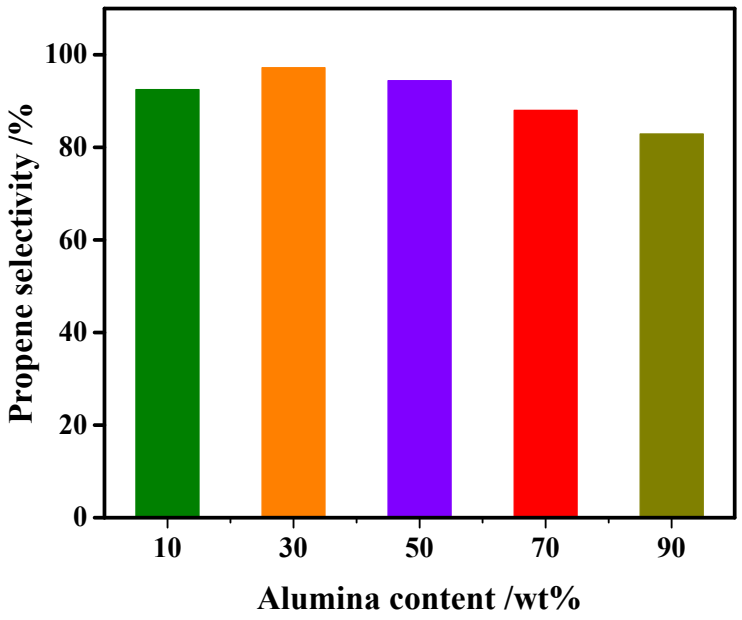

Figure S1 Propene selectivity of 3Mo/*h*Z-*x*Al catalysts with different alumina content. Reaction conditions: time on stream (TOS) = 4 h, T = 383 K, P = 0.1 MPa, WHSV = 1.5 $g \bullet g^{-1} \bullet h^{-1}$ (feed composition of metathesis reaction: 53 mol % ethene, 44 mol % 2-butene and 3 mol % 1-butene), ethene/2-butene = 1.2 (molar ratio).

Table S1. Products distribution of 2-butene/ethene cross-metathesis reaction over supported Mo-based catalysts

Catalysts	Conversion/%	Selectivity/%			
	$C_2^=$	$C_3^=$	$C_5^=$	$C_6^=$	$C_{7+}^=$
3Mo/*h*Z	0.8	71.2	11.6	8.2	9.0
3Mo/*h*Z-*10*Al	24.1	92.5	6.5	0.8	0.2
3Mo/*h*Z-*30*Al	49.2	97.2	2.3	0.3	0.2
3Mo/*h*Z-*50*Al	30.3	94.4	4.6	0.6	0.4
3Mo/*h*Z-*70*Al	10.9	88.0	9.0	1.9	1.1
3Mo/*h*Z-*90*Al	4.8	82.9	11.1	4.8	1.2
3Mo/Al	2.1	83.2	10.5	3.3	3.0

Reaction conditions: TOS = 4 h, T = 383 K, P = 0.1 MPa, WHSV = 1.5 $g \bullet g^{-1} \bullet h^{-1}$ (feed composition of metathesis reaction: 53 mol % ethene, 44 mol % 2-butene and 3 mol % 1-butene), ethene/2-butene = 1.2 (molar ratio). (note: $C_{7+}^=$ is used to denote the products in the C_7-C_{10} range)

Table S2. Mo content of the supported Mo-based catalysts.

Catalyst	Mo weight percentage (wt%)[a]
3Mo/*h*Z	2.6
3Mo/*h*Z-*10*Al	2.8
3Mo/*h*Z-*30*Al	2.8
3Mo/*h*Z-*50*Al	3.2
3Mo/*h*Z-*70*Al	3.2
3Mo/*h*Z-*90*Al	3.0
3Mo/Al	2.8

[a] measured by X-ray fluorescence (XRF).