

Synthesis of Polyoxymethylene Dimethyl Ethers over different microporous and mesoporous zeolites: The effects of acidity and pore size

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Key words: Polyoxymethylene dimethyl ethers; Pore size; acidity; Product distribution; Microporous and Mesoporous

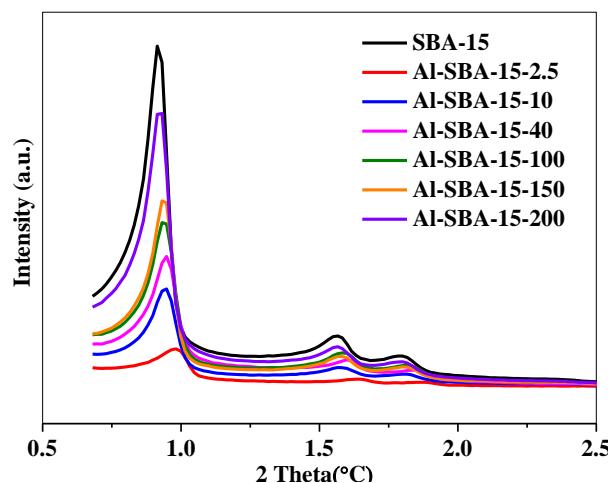


Fig.S1 XRD patterns of pure SBA-15 silica and Al-SBA-15 with different Si/Al ratios

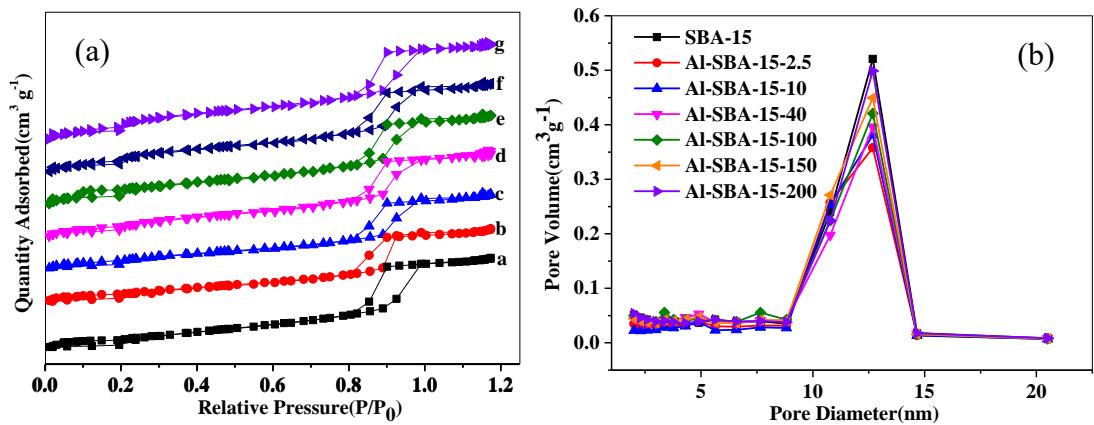


Fig.S2 N₂ adsorption-desorption isotherms (a) and pore size distribution (b) of SBA-15 and Al-SBA-15

Table S1 The physical properties of the Al-SBA-15 catalysts.

Catalyst	Si/Al ^a	S _{BET} ^b	V _p ^b	D _p ^b
		m ² g ⁻¹	cm ³ g ⁻¹	nm
SBA-15	~	685	1.23	11.83
Al-SBA-15-2.5	3.1	445	0.93	12.53
Al-SBA-15-10	9.3	467	0.99	12.40
Al-SBA-15-40	35.8	540	1.06	12.30
Al-SBA-15-100	93.6	586	1.12	12.14
Al-SBA-15-150	134.2	603	1.15	11.99
Al-SBA-15-200	176.5	628	1.19	11.88

^a Detected by XRF

^a S_{BET}: specific surface area; V_p: Total Pore volume; D_p: Pore diameter

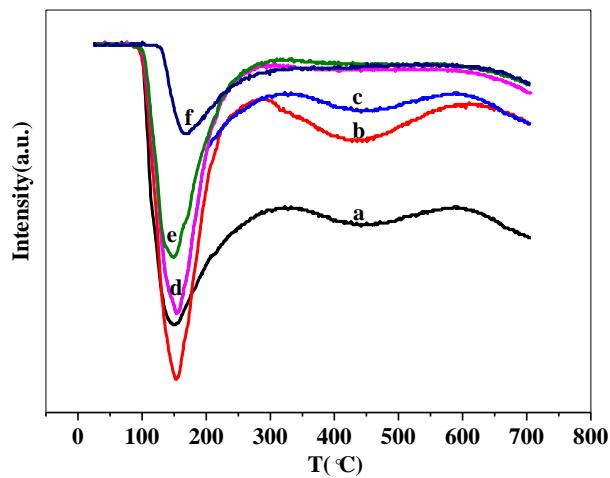


Fig.S3 NH_3 -TPD profiles of (a) Al-SBA-15-2.5, (b) Al-SBA-15-10, (c) Al-SBA-15-40, (d) Al-SBA-15-100, (e) Al-SBA-15-150 and (f) Al-SBA-15-200

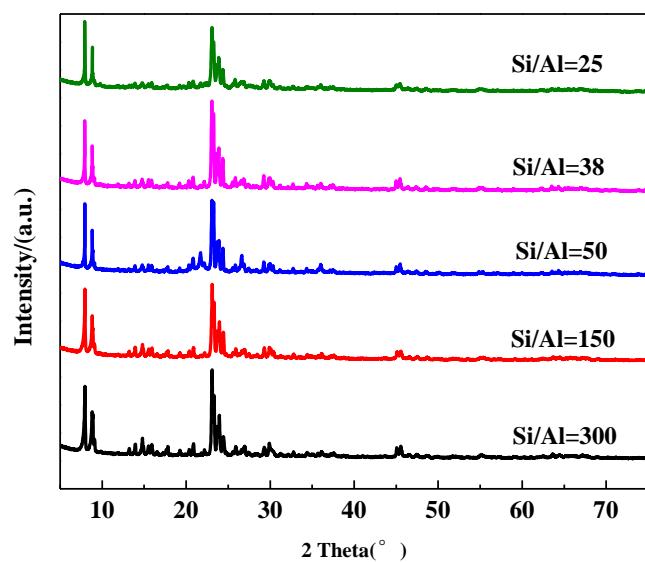


Fig.S4 XRD patterns of HZSM-5 with different Si/Al ratios

Table S2 The physical properties of ZSM-5

Catalyst	S_{BET}^{a}	V_p^{a}	D_p^{a}
	$\text{m}^2 \cdot \text{g}^{-1}$	$\text{cm}^3 \cdot \text{g}^{-1}$	nm
ZSM-5-25	354.40	0.26	0.5394
ZSM-5-38	377.78	0.22	0.5397
ZSM-5-50	357.96	0.24	0.5492
ZSM-5-150	376.57	0.23	0.5447
ZSM-5-300	356.10	0.23	0.5477
ZSM-5-360	371.41	0.24	0.5475

^a S_{BET} : specific surface area; V_p : Total Pore volume; D_p : Pore diameter

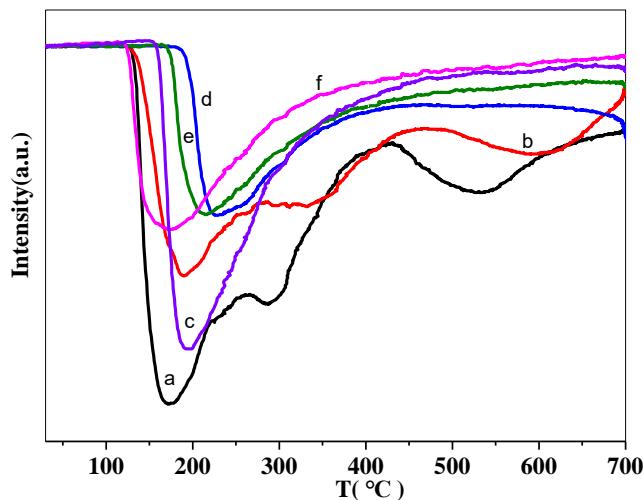


Fig.S5 NH₃-TPD profiles of (a) ZSM-5-25, (b) ZSM-5-38, (c) ZSM-5-50, (d) ZSM-5-150, (e) ZSM-5-300, (f) ZSM-5-360