Electronic Supplementary Information (ESI) for

Growth of ZSM-5 Zeolite Microparticles from Crystal Seeds for Catalytic Hydration of Cyclohexene

Ying Tang, Baojun Li, Ning Zhang, Songlin Wang, Yiqiang Wen, Peng Jin, and Xiangyu Wang*

Department of Chemistry, Zhengzhou University, Zhengzhou 450001, P R China

*Corresponding author. E–mail: xiangyuwang@zzu.edu.cn

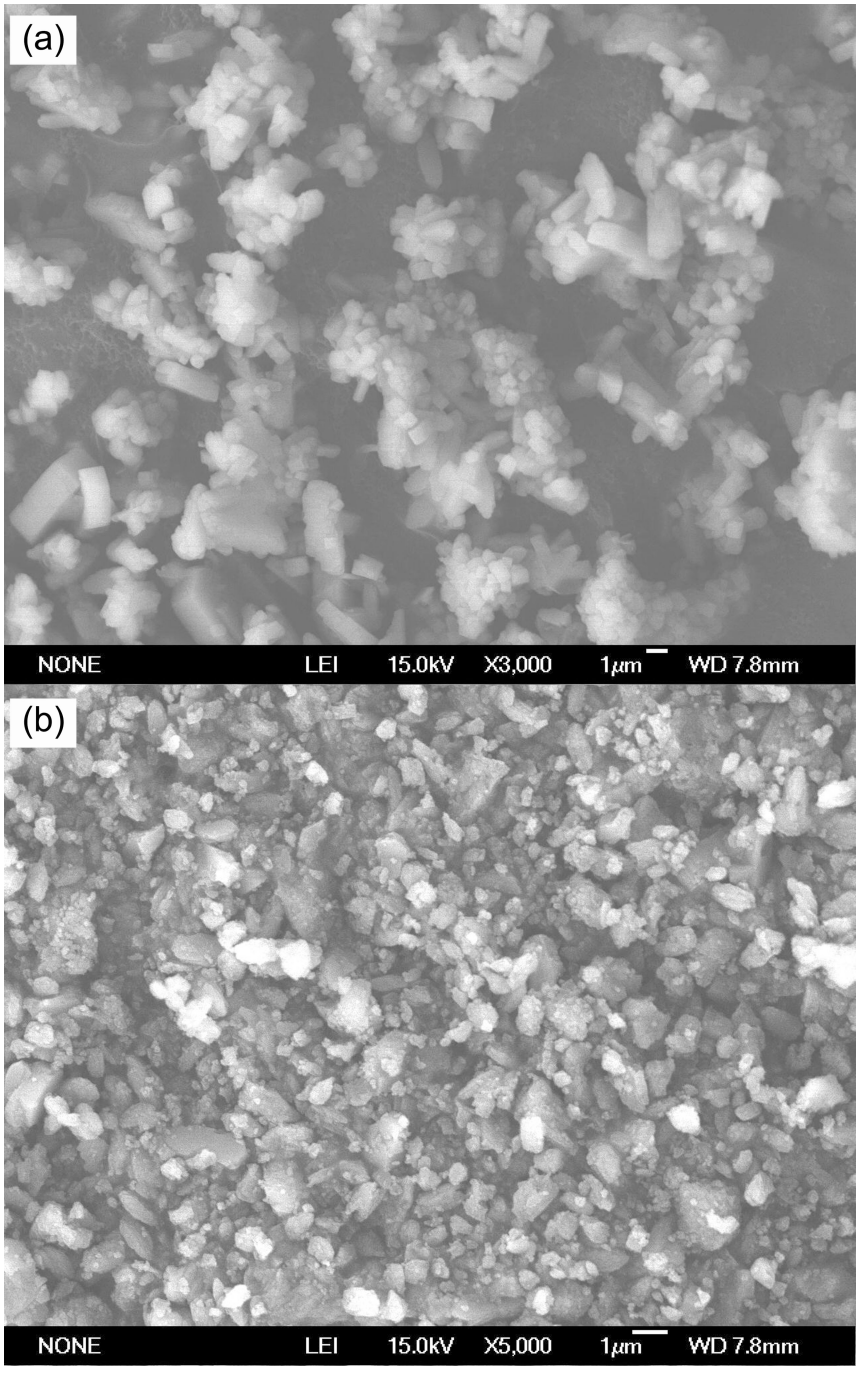

Figure S1. The scanning electron microscopy images of (a) NZ, and (b) JZ.

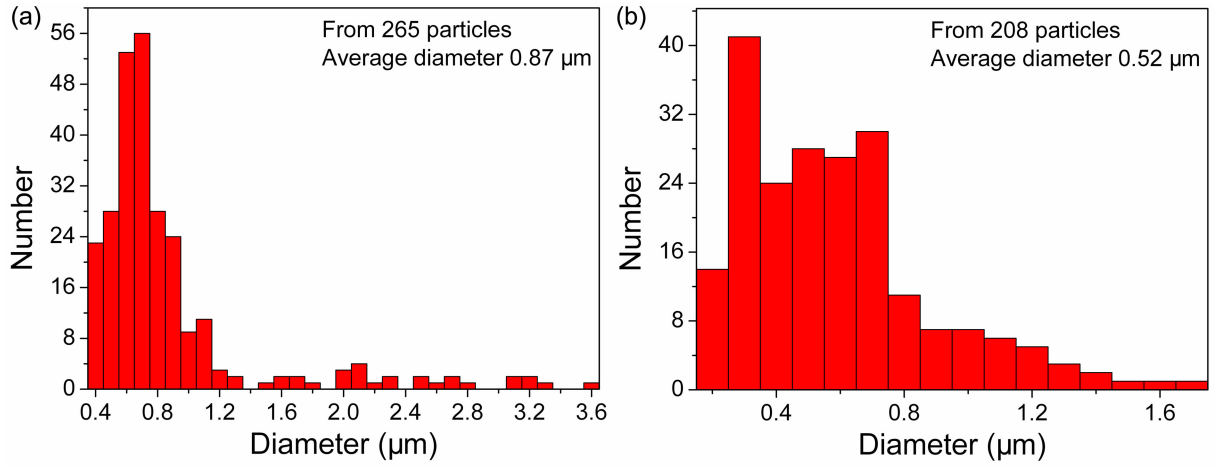

Figure S2. The particle diameter distribution of (a) NZ and (b) JZ sub-microparticles measured from SEM images in Figure S1.

Table S1. Relative crystallinity and crystal size of H-ZSM-5 zeolites with different sizes.

Sample	Average diameter (μm)	Aging time (h)	Relative crystallinity (%)[a]	Crystallite Size (nm)		
				(101)	(112)	(313)
ZSM-5-A	8.78	0	92	80	40	80
ZSM-5-B	4.08	5	96	57	38	68
ZSM-5-C	2.15	20	99	53	38	63
ZSM-5-D	1.52	24	94	53	36	63
NZ	0.87	--	93	50	36	58
JZ	0.52	--	100	50	38	58

[a]The relative crystallinity was calculated with JZ as reference by comparing the area sum of the most strong five peaks (2θ = 23.0-24.5 °).

Table S2. The acid strength and concentration of H-ZSM-5 zeolites.

Sample	Average diameter (μm)	T_{peak} (°C)	Acid concentration (mmol g^{-1}_{cat})	A_B/A_L[a]
ZSM-5-B	4.08	235	0.340	0.848
		435	0.253	
ZSM-5-C	2.15	230	0.272	0.889
		445	0.273	
NZ	0.87	220	0.317	0.909
		435	0.278	
JZ	0.52	222	0.233	0.947
		442	0.291	

[a] A_B/A_L: the concentration ratio of Brönsted acid sites (A_B) and Lewis acid sites (A_L) draw from Py-IR.