

Fig. S1 XRD patterns (A), SEM images (B), N₂ adsorption-desorption isothermals (C) and ²⁷Al MAS NMR spectra (D) of the raw material zeolite Beta.



Fig. S2 XRD patterns of the raw material BEA zeolite and product MFI zeolite synthesized via strategy A for the whole crystallization from 0 to 9 h



Fig. S3 ²⁷Al MAS NMR spectra of the solid obtained for the crystallization time of 0 h, 20 min and 40 min



Fig. S4 The height ratios between bands at 624 cm⁻¹ and 573 cm⁻¹ (A-the red line), 524 cm⁻¹ and 573 cm⁻¹ (A-the blue line), 545 cm⁻¹ and 450 cm⁻¹ (B) in FTIR spectroscopy

Table S1 Acidity characteristic of H-nano-ZSM-5 and com-ZSM-5 measured by NH3-TPD and relative content of Silicon and Aluminum tested by ICP

Sample	T _{peak} (9	Acid amount ^{<i>b</i>} (μ mol·g ⁻¹)			
	LT peak ^b	HT peak ^b	Total	Weak	Strong
			acidity	acidity	acidity
H-nano-ZSM-5	157.2	336.4	115.1	52.8	62.3

com-ZSM-5	150.1	338.2	131.7	80.8	50.9
-----------	-------	-------	-------	------	------

^a Determined by ICP.

^b The LT peak represents a low temperature desorption peak. The HT peak represents a high temperature desorption peak.

^c Calculated with Gaussian function fit.

Table S2 Te	extual properties	s of H-nano-	ZSM-5 and	com-ZSM-5	measured l	by nitrogen
physisorptic	on.					

Sample —	Surface area $(m^2 \cdot g^{-1})$			Pore volume (cm ³ ·g ⁻¹)		
	S _{BET} ^a	S _{micro} ^b	S _{ext} ^b	V _{total} ^c	V _{micro} ^b	V _{meso} ^d
H-nano-ZSM-5	478.7	367.8	110.8	0.51	0.16	0.35
com-ZSM-5	452.9	395.3	57.7	0.23	0.17	0.04

^a Surface area determined by Brunauer-Emmett-Teller (BET) method.

^b Micropore and external surface area and micropore volume determined by t-plot method.

^{*c*} Total pore volume at $P/P_0 = 0.99$

^{*d*} Mesopore volume, $V_{meso} = V_{total} - V_{micro}$.