

Heterogeneous & Homogeneous & Bio- & Nano-

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Supporting Information

Facile Synthesis of a Novel Hierarchical ZSM-5 Zeolite: A Stable Acid Catalyst for Dehydrating Glycerol to Acrolein

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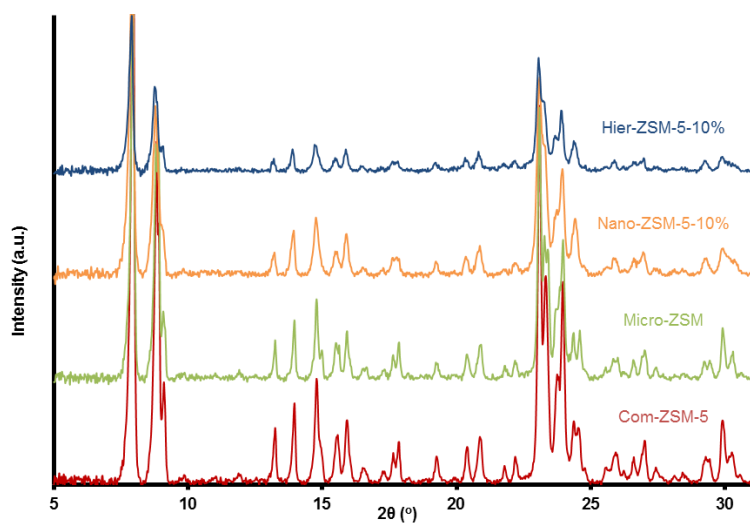


Fig. S1 XRD diffractograms of ZSM-5 samples with varied crystal size.

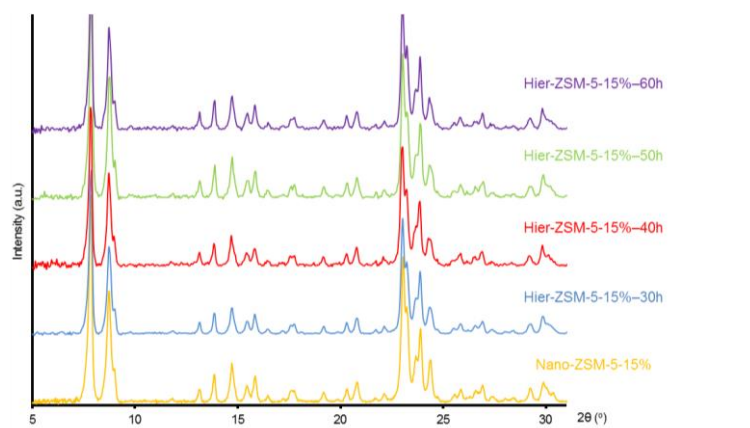


Fig. S2 XRD diffractograms of ZSM-5 samples with optimized crystallization conditions.

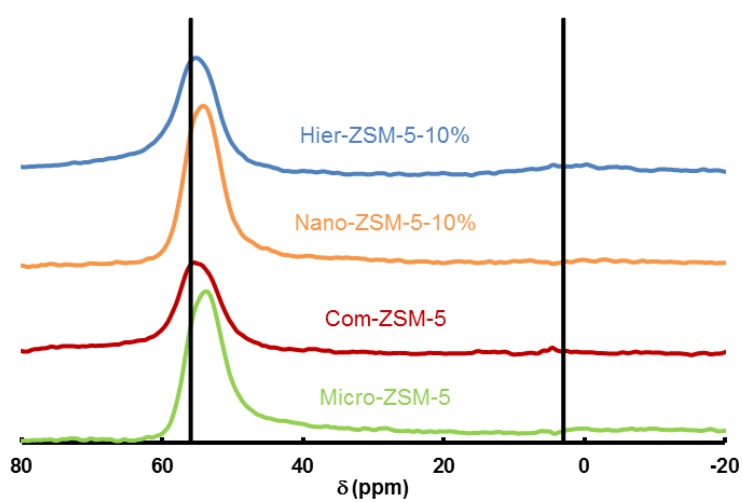


Fig. S3 Solid state ^{27}Al NMR spectra for ZSM-5 samples with varied crystal size.

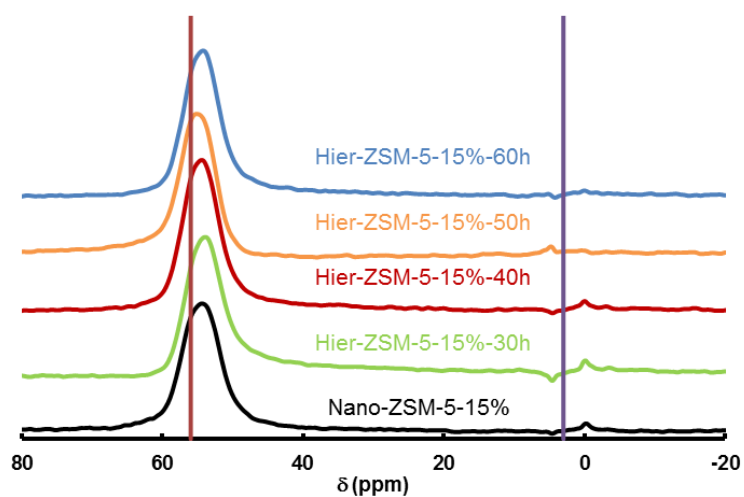


Fig. S4 Solid state ^{27}Al NMR spectra for ZSM-5 samples with optimized crystallization conditions.

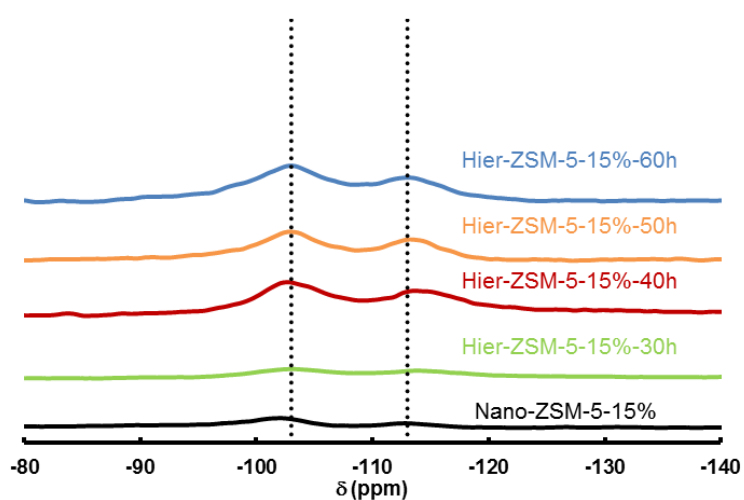


Fig. S5 Solid state ^{29}Si NMR spectra for ZSM-5 samples with optimized crystallization conditions.

Table S1. Physical properties of Hier-ZSM-5-15% samples, after 20 min ultrasonic treatment at 50 Hz.

Sample	Hydrothermal reaction time (h)	SA_{BET} ($\text{m}^2 \text{g}^{-1}$)	$\text{SA}_{\text{external}}$ ($\text{m}^2 \text{g}^{-1}$)	V_{micro} ($\text{cm}^3 \text{g}^{-1}$)	V_{total} ($\text{cm}^3 \text{g}^{-1}$)
Hier-ZSM-5-15%	30	347	177	0.08	0.31
Hier-ZSM-5-15%	40	345	169	0.09	0.26
Hier-ZSM-5-15%	50	339	184	0.08	0.30
Hier-ZSM-5-15%	60	330	171	0.08	0.33

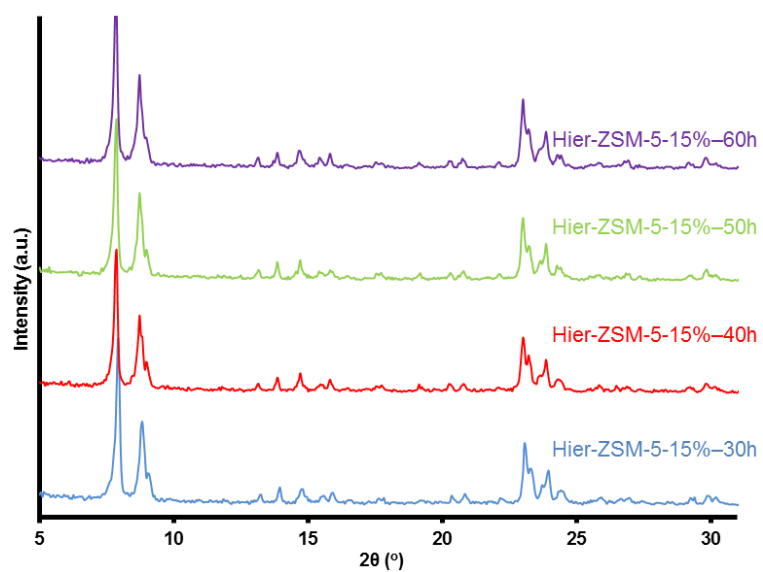


Fig. S6 XRD diffractograms of Hier-ZSM-5-15% samples, after 20 min ultrasonic treatment at 50 Hz.