

*Supplementary Information for*

**Catalytic Consequences of Micropore Topology, Mesoporosity, and Acidity on the Hydrolysis of Sucrose over Zeolite Catalysts**

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**Table S1.** Rate constant of hydrolysis of sucrose in zeolites with a variety of micropore topology, mesoporosity, and acidity (Si/Al ratio).

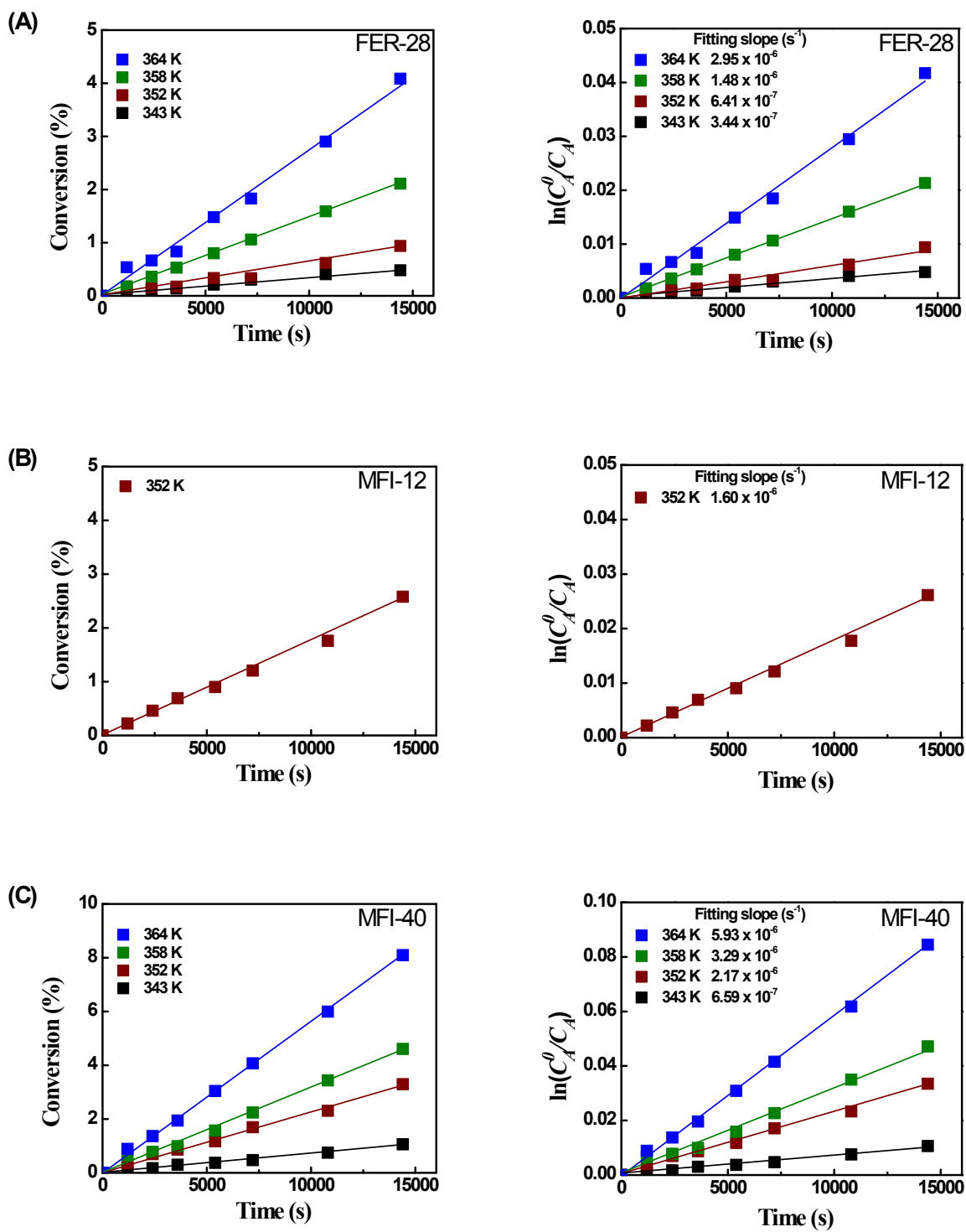
Zeolite			Measured rate constant ( $k_{hydro}$ , x $10^3$ , s <sup>-1</sup> (mol H <sup>+</sup> ) <sup>-1</sup> ) <sup>b</sup>				
Topology	Name	Si/Al ratio <sup>a</sup>	343 K	352 K	358 K	364 K	
Medium-pore	FER	28	2.99	5.57	12.9	25.7	
	MFI	12	-	6.25	-	-	
		40	8.11	26.7	40.5	72.9	
		70	7.99	15.3	29.7	69.5	
Large-pore	MOR	45	6.94	13.4	40.2	72.8	
	MWW	20	7.53	33.2	53.9	93.8	
		30	14.6	41.0	79.5	186	
	BEA	12	-	6.37	-	-	
		19	3.90	13.2	28.1	39.5	
		100	43.5	122	331	538	
	FAU	15	84.5	299	818	1225	
		40	691	2435	4853	7794	
	Mesopore	PMFI	69	24.3	51.8	222	255
			150	-	144	-	-
200			-	86	-	-	
PMWW		30	25.3	94	189	322	
Industrial standard	Amberlyst-15 <sup>c</sup>	-	121	214	274	463	

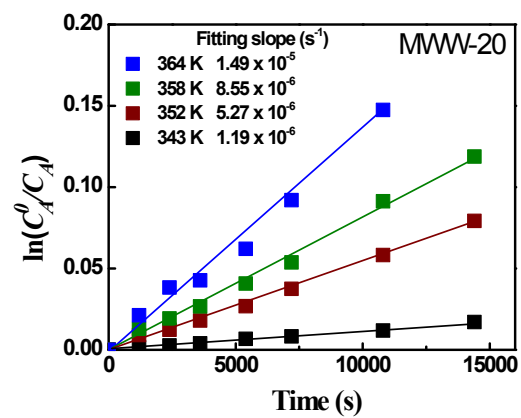
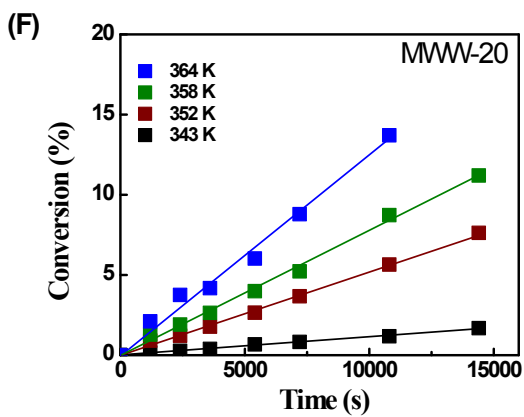
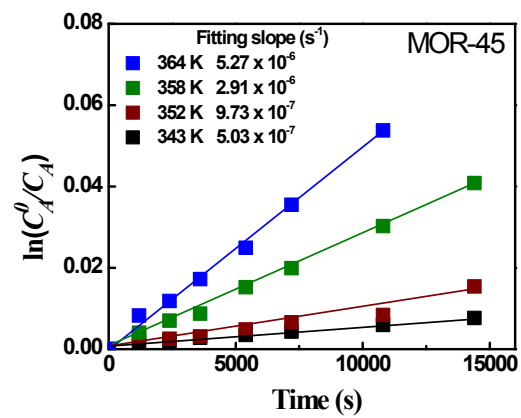
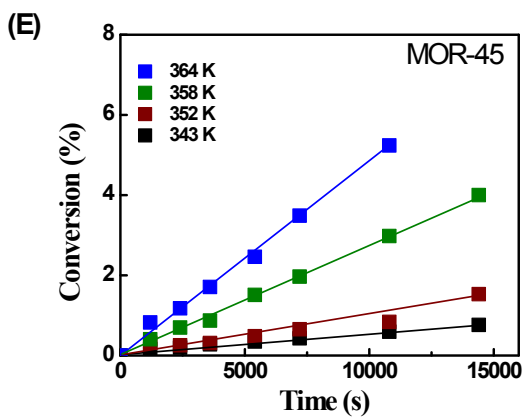
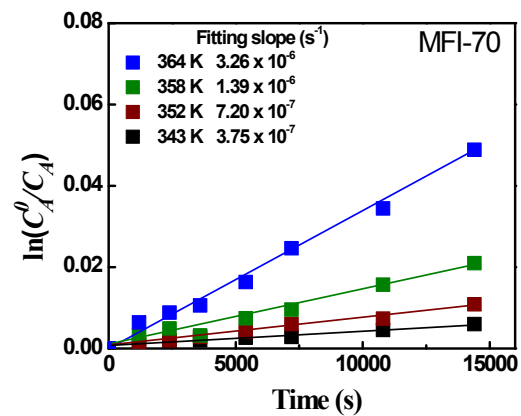
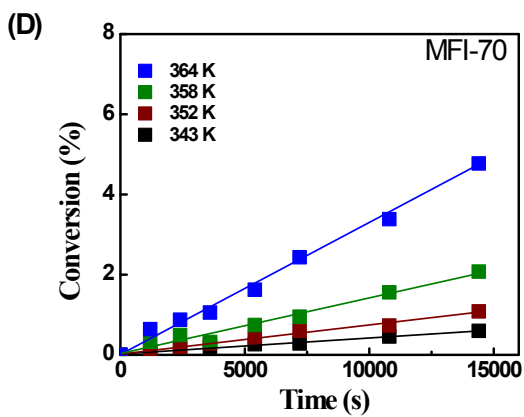
<sup>a</sup> Determined from elemental analysis (ICP-OES). <sup>b</sup> Errors are within  $\pm 7\%$  of the measured rate constant.

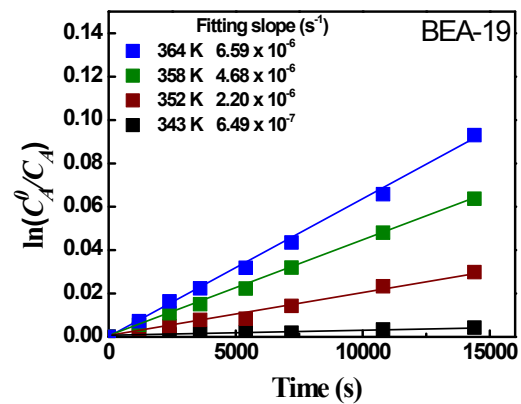
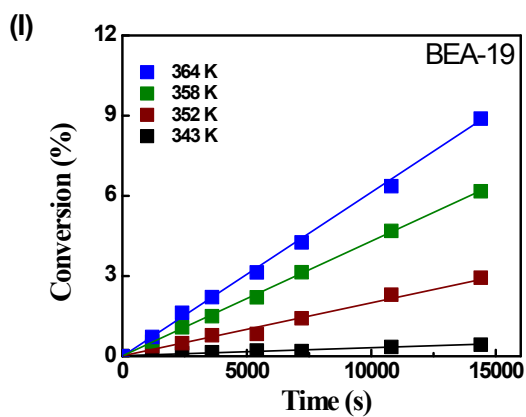
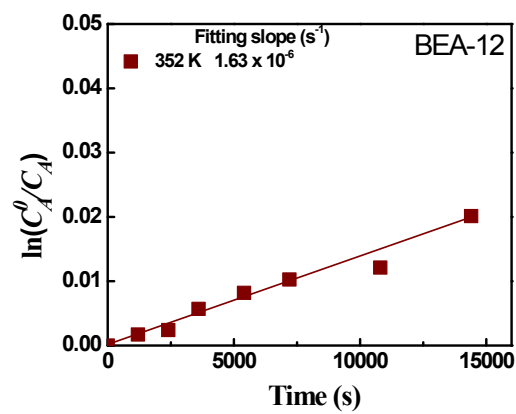
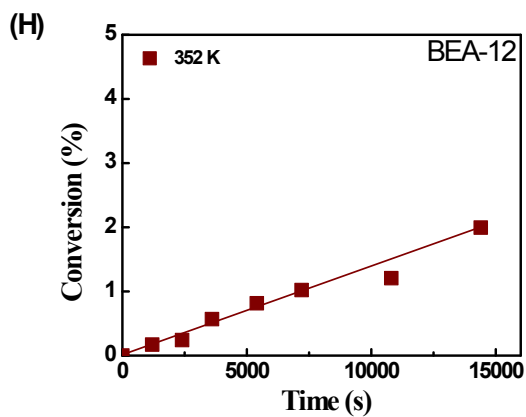
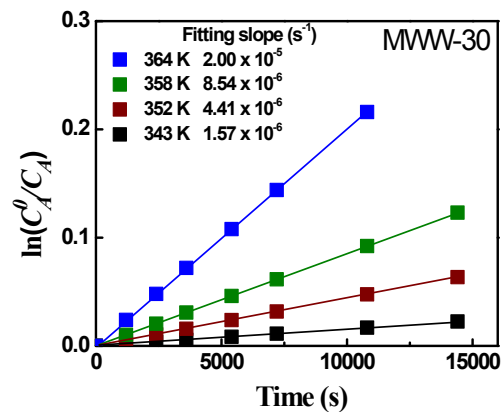
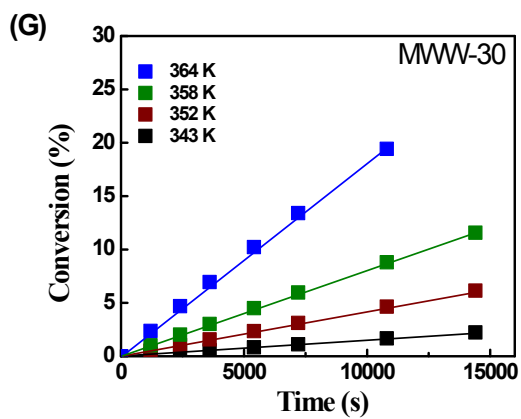
<sup>c</sup> Purchased from Alfa Aesar. The number of acid sites is  $4.7 \times 10^{-3}$  mol H<sup>+</sup> per gram of the catalyst.

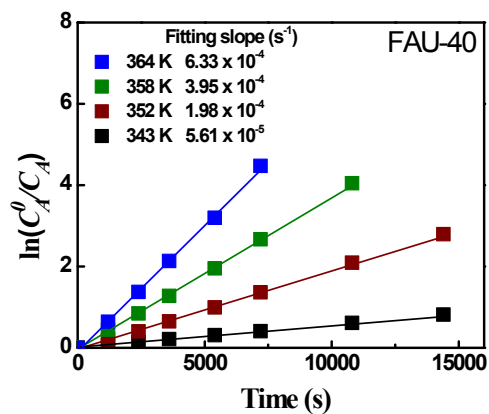
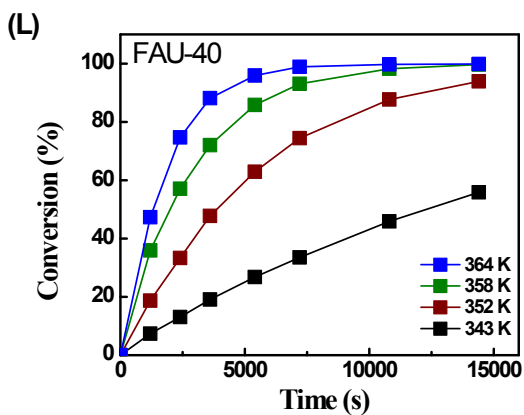
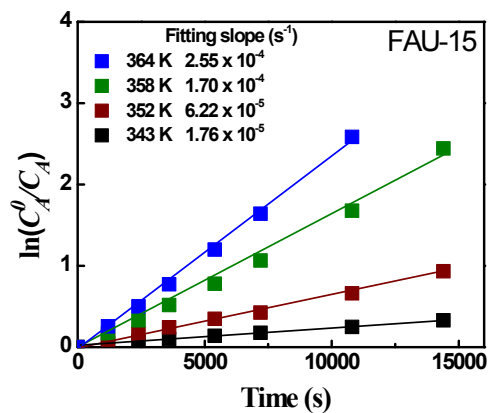
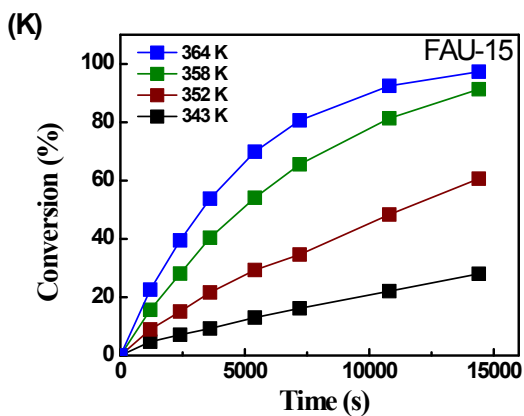
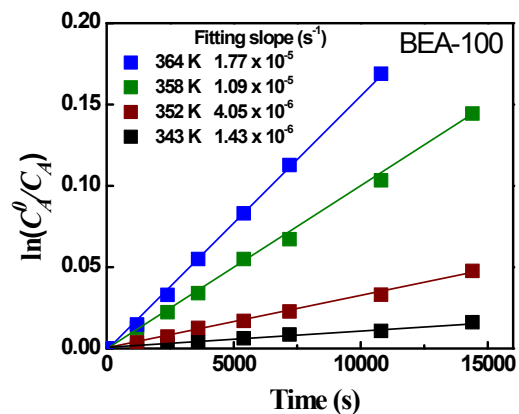
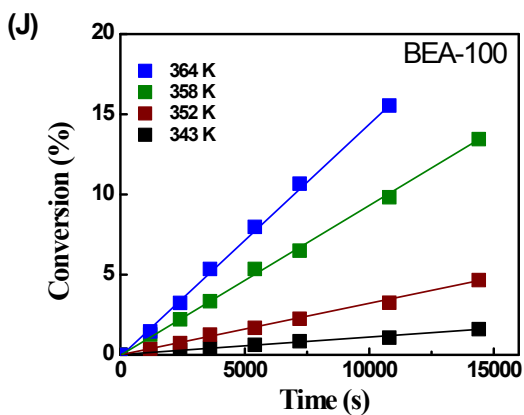
Left: Conversion vs. reaction time

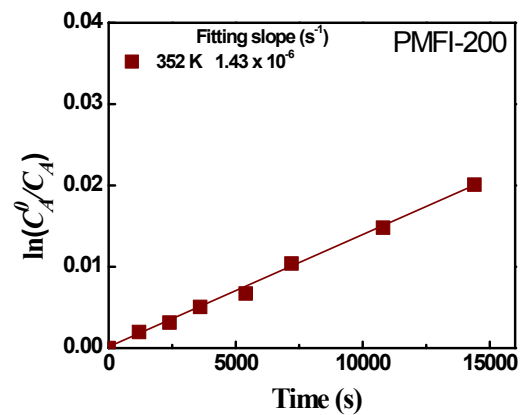
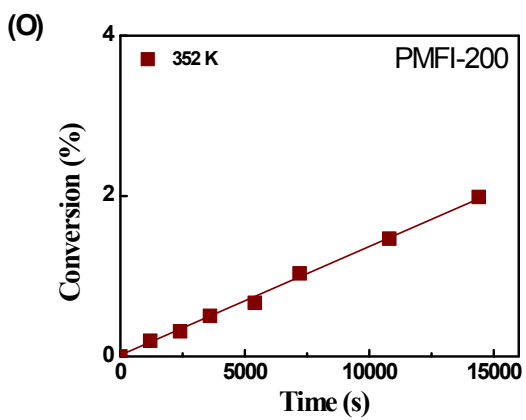
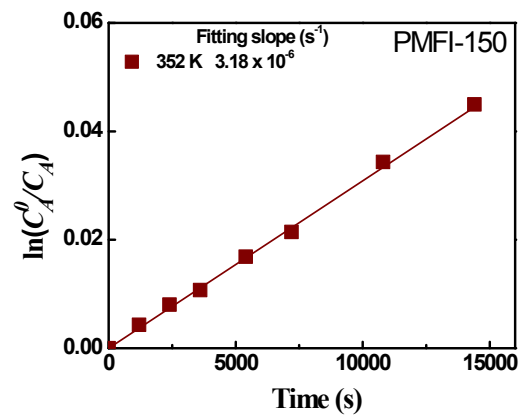
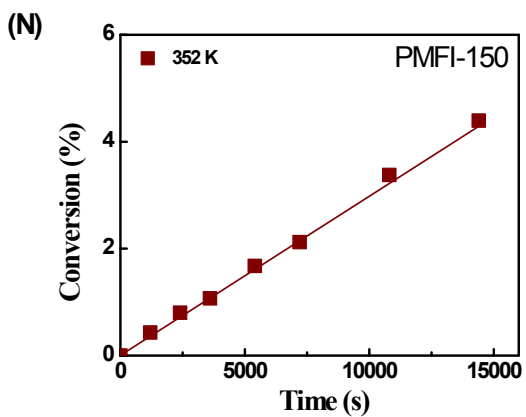
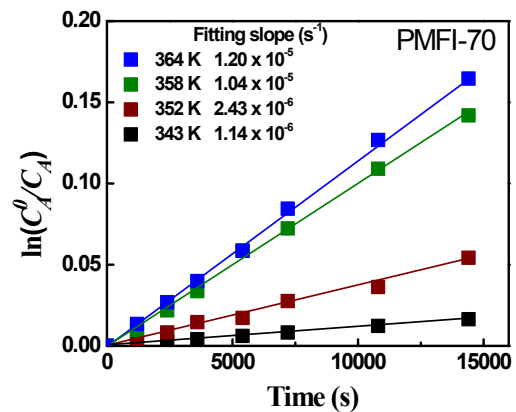
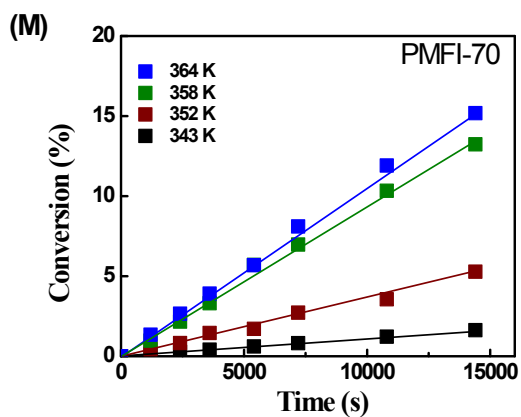
Right:  $\ln(C_A^0/C_A)$  vs. reaction time

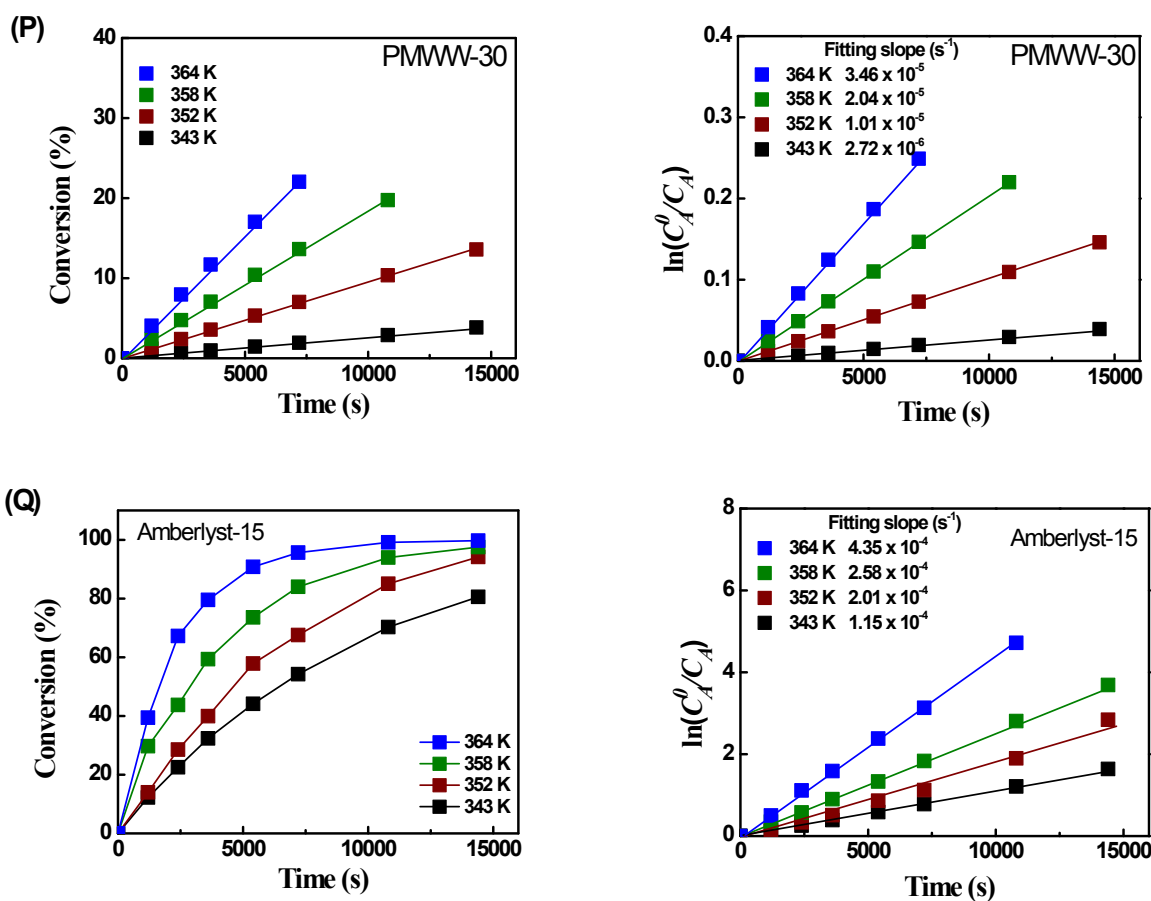






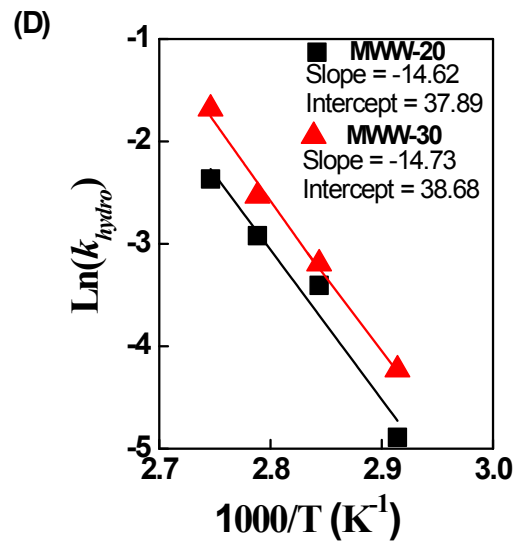
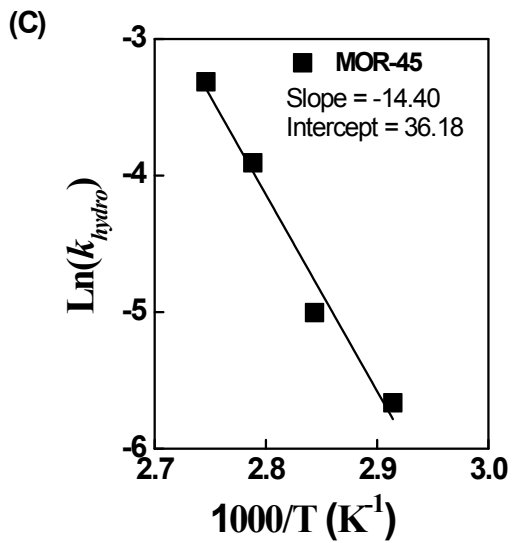
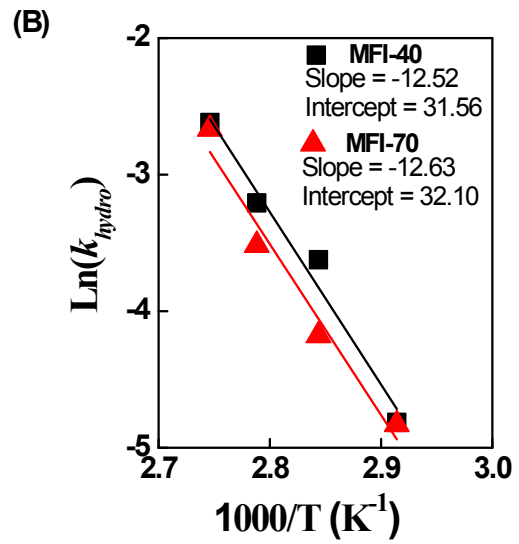
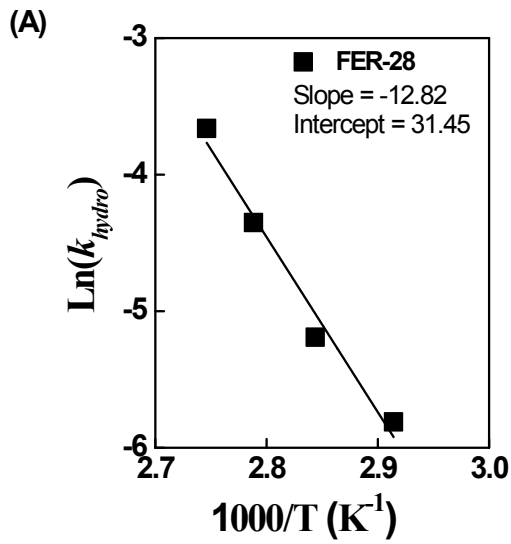


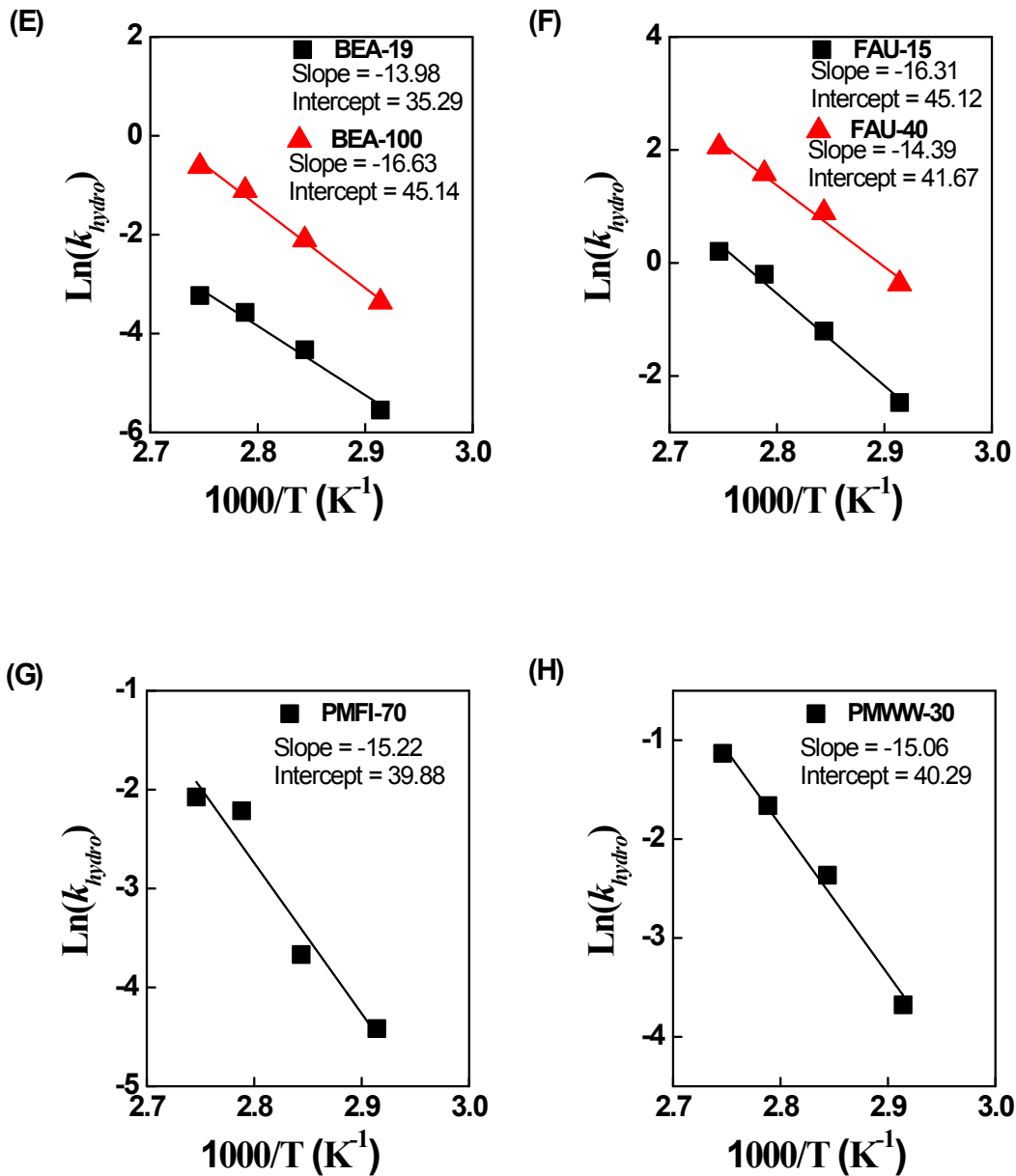




**Figure S1.** Plots for sucrose conversion as a function of reaction time and rate constant determination (next to plot for conversion vs. reaction time) for sucrose hydrolysis reactions over 0.2 g catalysts: (A) FER-28, (B) MFI-12, (C) MFI-40, (D) MFI-70, (E) MOR-45, (F) MWW-20, (G) MWW-30, (H) BEA-12, (I) BEA-19, (J) BEA-100, (K) FAU-15, (L) FAU-40, (M) PMFI-70, (N) PMFI-150, (O) PMFI-200, (P) PMWW, and (Q) Amberlyst-15. (The slope of each plot in rate determination is the measured rate constant,  $k_{\text{hydro}}M_B$  (mol s<sup>-1</sup>)).







**Figure S2.** Plots for the measured activation energy and measured entropy determination in sucrose hydrolysis reactions over zeolite catalysts: (A) FER-28, (B) MFI-40 and MFI-70, (C) MOR-45, (D) MWW-20 and MWW-30, (E) BEA-19 and BEA-100, (F) FAU-15 and FAU-40, (G) PMFI-70, and (H) PMWW-30. (The slope and intercept of each plot are used for the measured activation energy ( $\Delta E_{\text{meas}}$ ) and measured entropy ( $\Delta S_{\text{meas}}$ ) determination).