

Supplementary Information

Supplementary tables and figures

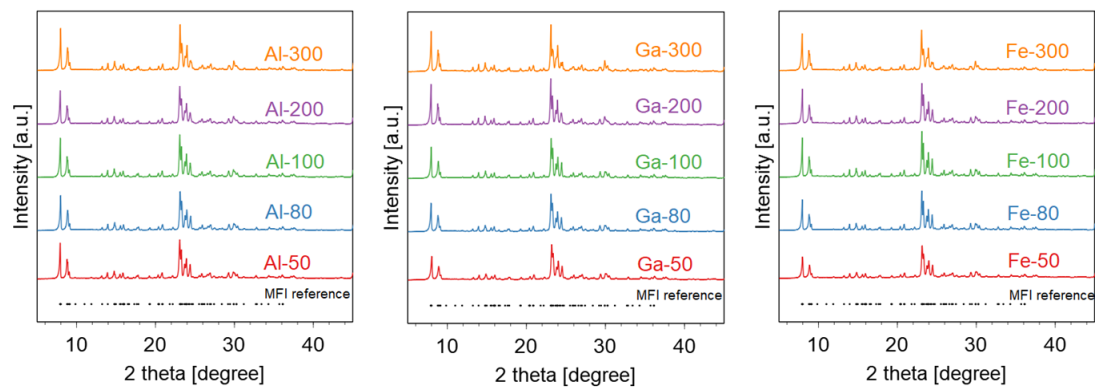


Fig. S1. The XRD patterns of each sample.

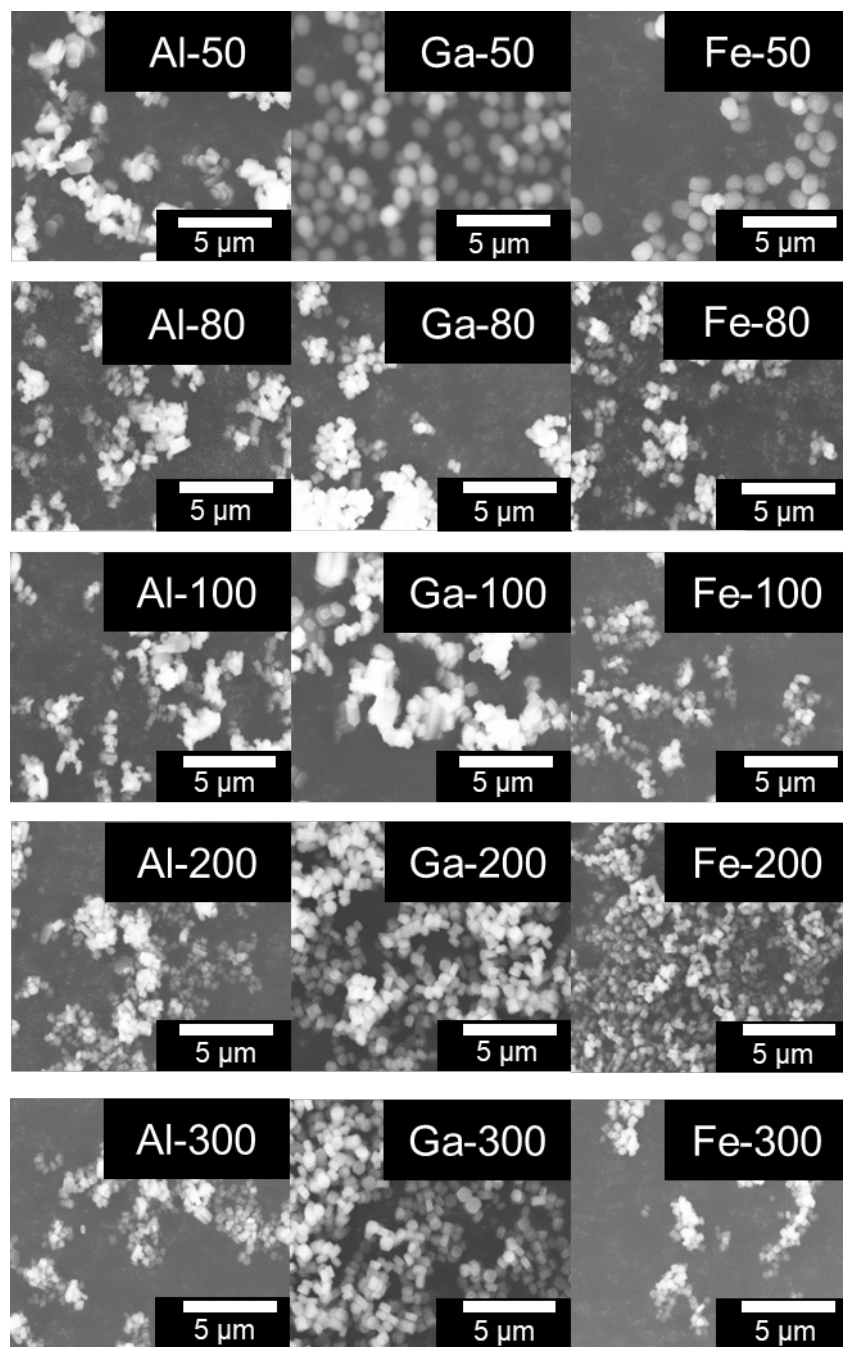


Fig. S2. SEM images of each sample.

Table S1. EDX analysis results of each sample.

Si/T ratios [-]			
gel	Fe	Al	Ga
50	29.3	38.5	28.4
80	59.6	48.6	52.3
100	67.6	59.3	74.1
200	141.1	78.2	119.3
300	237.7	117.7	227.3

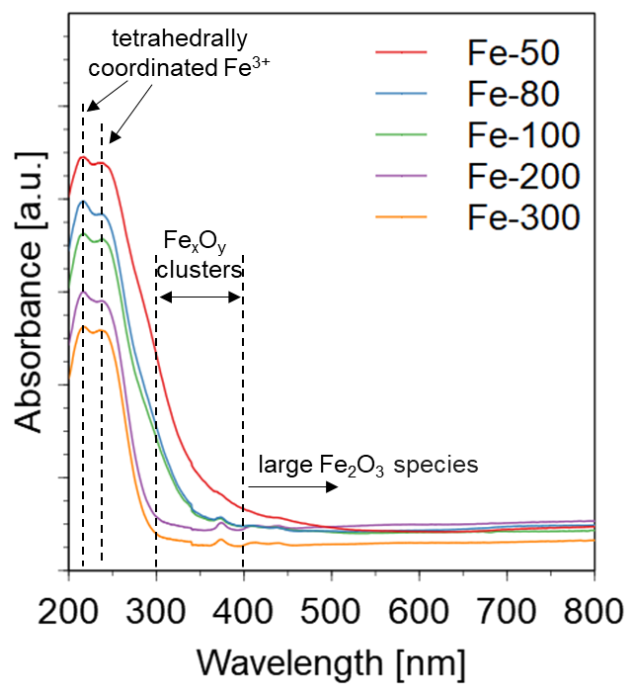


Fig. S3. UV spectra of each sample with Fe introduced.

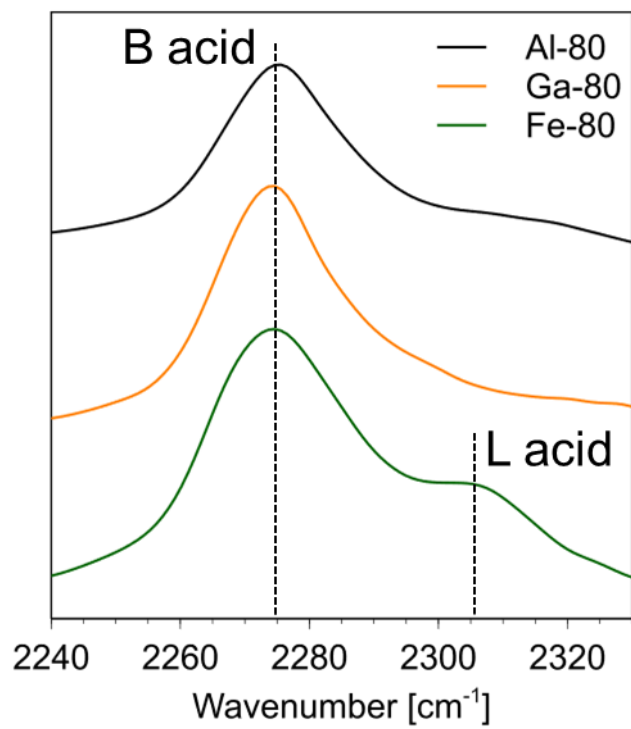


Fig. S4. FT-IR spectra of each sample.

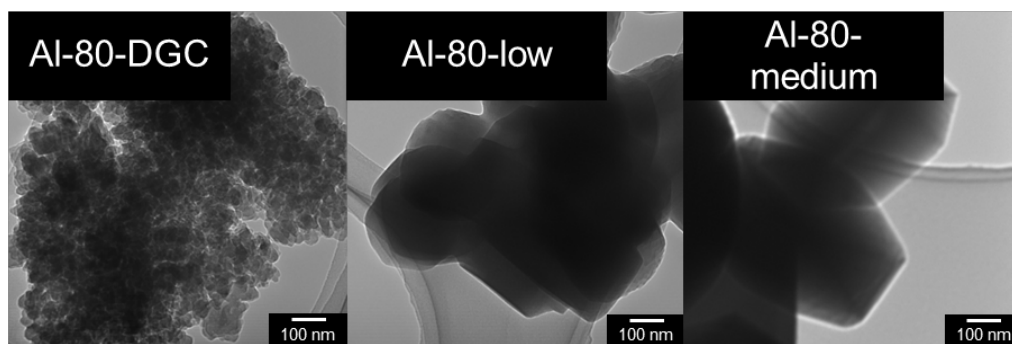


Fig. S5. TEM images of MFI zeolites with different particle sizes.

Table. S2 Si/Al, acid amount and T_{half} of particle size modified MFI zeolite.

samples	Al-80-DGC	Al-80-low	Al-80-medium
External surface [m ² /g]	91.0	62.6	24.6
Si/Al ratio [-]	64.3	64.2	73.4
Acid amount [mol/g]	0.048	0.045	0.049
T_{half} [°C]	331	375	400

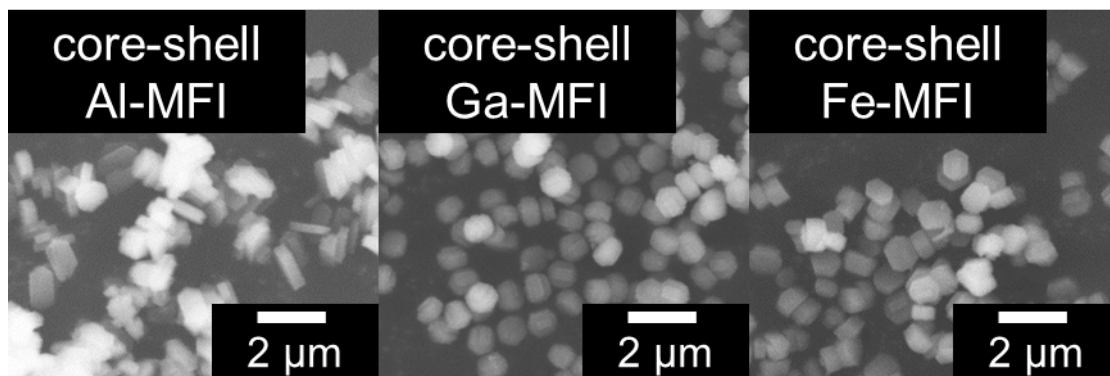


Fig. S6. SEM images of core-shell zeolites coated with Al-MFI, Ga-MFI, and Fe-MFI by silicalite-1.

Table S3. EDX analysis results of uncoated and core-shell samples.

T	Si/T ratios [-]	
	core	core-shell
Al	48.6	72.6
Ga	52.3	75.6
Fe	59.6	70.3