SUPPORTING INFORMATION

Microwave-assisted interzeolite transformations

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Experimental

The IZT transformations were performed using a parent FAU zeolite with Si/Al ratio close to 3.0 synthesized by a previously reported procedure. [1] Selected amount (Table 1) of the parent FAU zeolite was placed in alkaline solutions of NaOH (≥98%, Sigma-Aldrich), KOH (90%, Sigma-Aldrich), or $CsOH{\cdot}H_2O$ (≥90%, Sigma-Aldrich) and distilled water. The crystallization was performed using a microwave reactor Monowave 400 (Anton Paar) and a SiC autoclave (10 cm^3). The time for reaching the desired temperature was 5 min for all syntheses. During the synthesis,

the batch was homogenized at 1200 rpm. Additionally, synthesis at 10 rpm was performed, which showed no influence on the final structure. After the synthesis, each sample was filtered, washed with distilled water and dried at 60 ^{o}C for overnight.

The powder X-ray diffraction (XRD) patterns were obtained using a Bruker D8 Discover diffractometer working with copper radiation (λ_1 = 1.5406 Å, λ_2 = 1.5444 Å) in θ-2θ mode and using step size 0.04°, time per step 0.2 s and a LynxEye detector. Phase identification and quantification were carried out using the EVA software (Bruker AXS) with an integrated database of the International Center for Diffraction Data (ICDD). Unit cell parameters were refined using the Le Bail method using TOPAS-3 (Bruker AXS) software. Scanning electron microscopy (SEM) micrographs and energy dispersive spectroscopy (EDS) chemical analysis were performed on a NanoSEM-FEI Nova 200 equipped with an EDAX Pegasus X4M detector. To determine the chemical bonds of each one of the synthesized zeolite, Fourier transform infrared spectroscopy (FTIR) in the Attenuated Total Reflection (FTIR-ATR) mode was performed through a PerkinElmer Spectrum Two system. Each one of FTIR spectra was obtained with 16 scans in a resolution of 4 cm^{-1} between 1500 and 400 cm^{-1}.

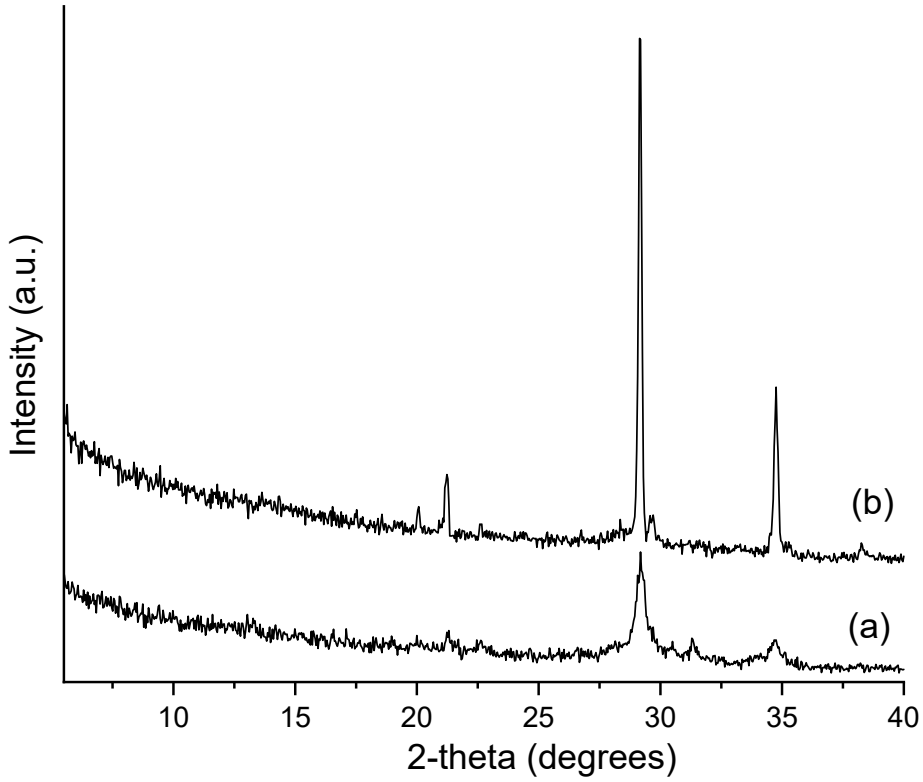


Figure S1. Powder XRD patterns show the formation of **$KAlSiO_4$** at (a) 80 °C for 185 min and (b) at 160 °C for 15 min in the system: 0.5 g FAU – 4.47 g KOH – 3.9 g H_2O.

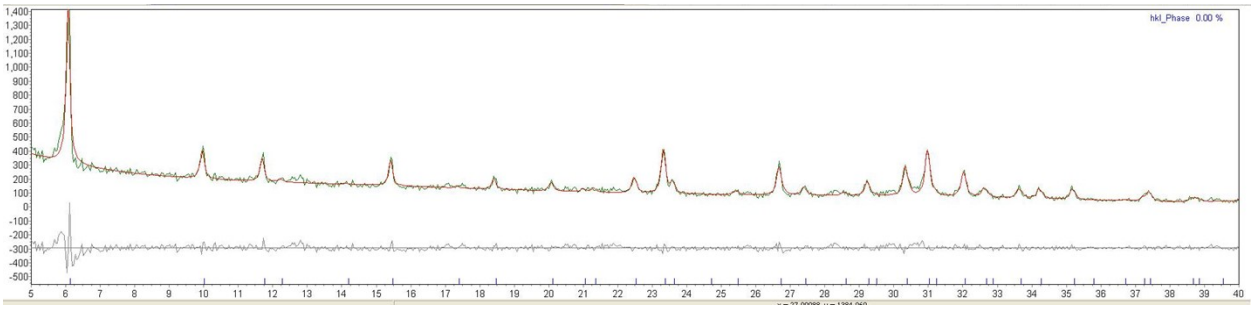


Figure S2. Le Bail fit of **FAU** zeolite obtained after desilication at 130 °C for 15 min.

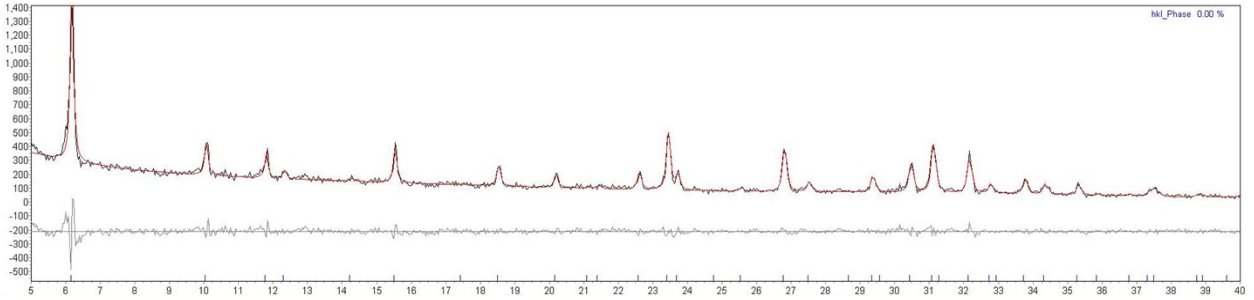


Figure S3. Le Bail fit of **FAU** zeolite obtained after desilication at 140 °C for 15 min.

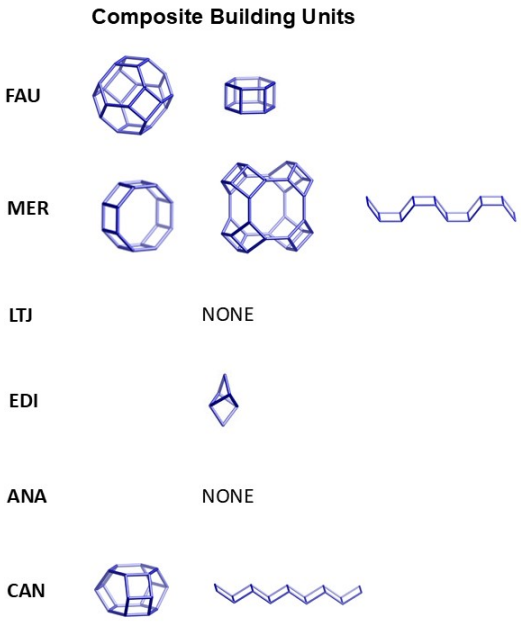


Figure S4. Comparison between the composite building units of the parent **FAU** zeolite the daughter zeolites.

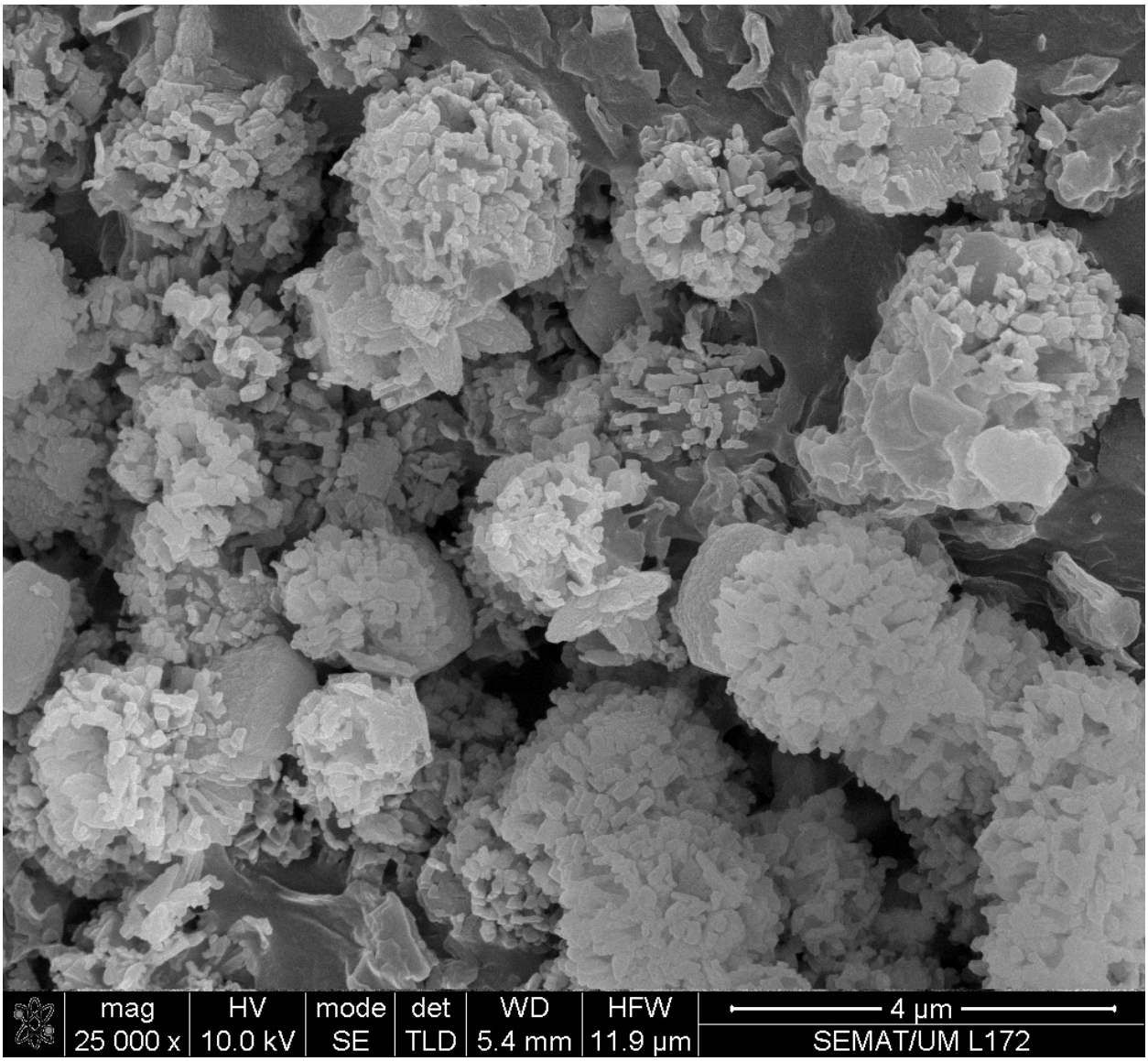


Figure S5. SEM image of partially dissolved **FAU** zeolite obtained at 130 °C for 15 min.

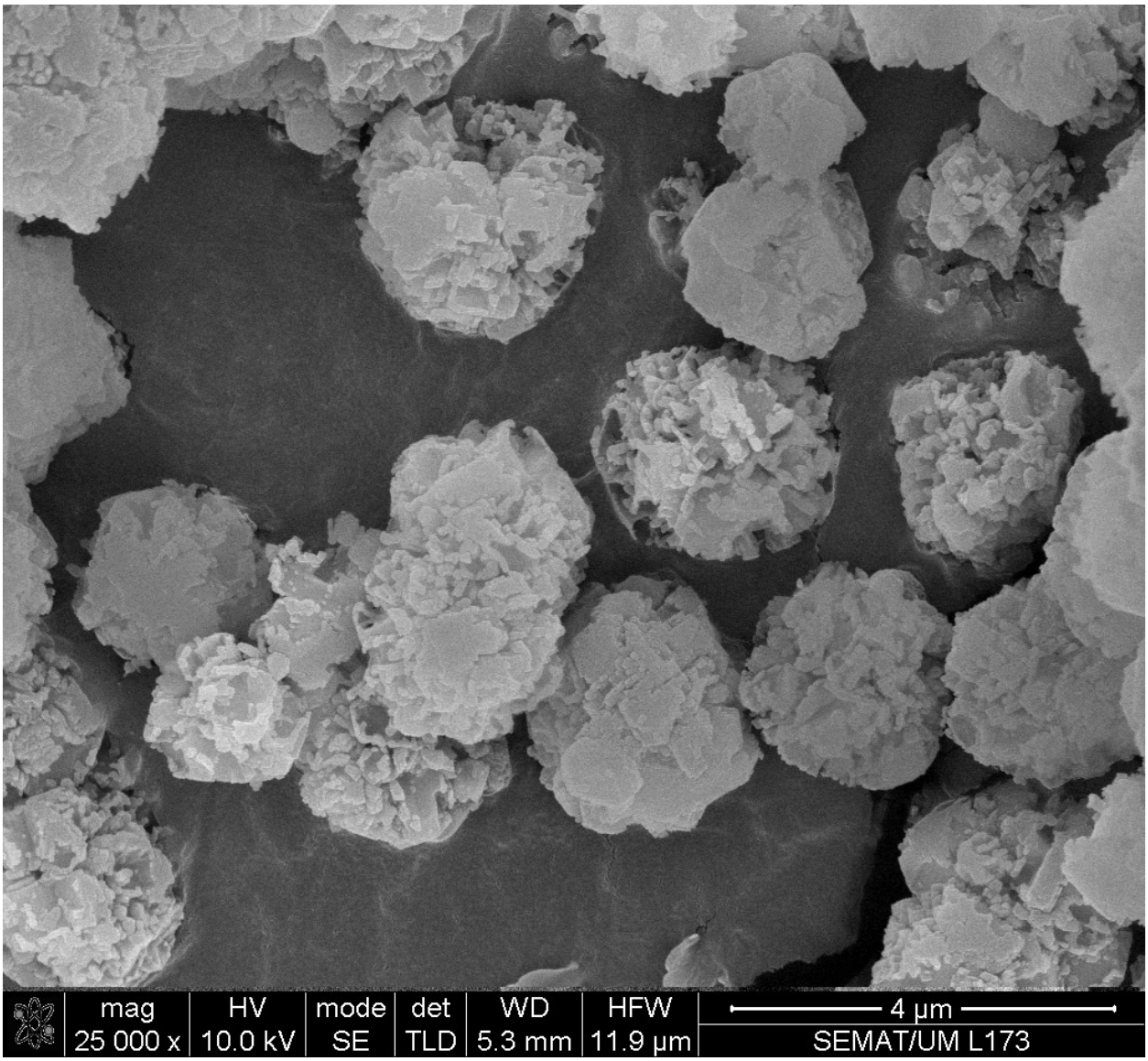
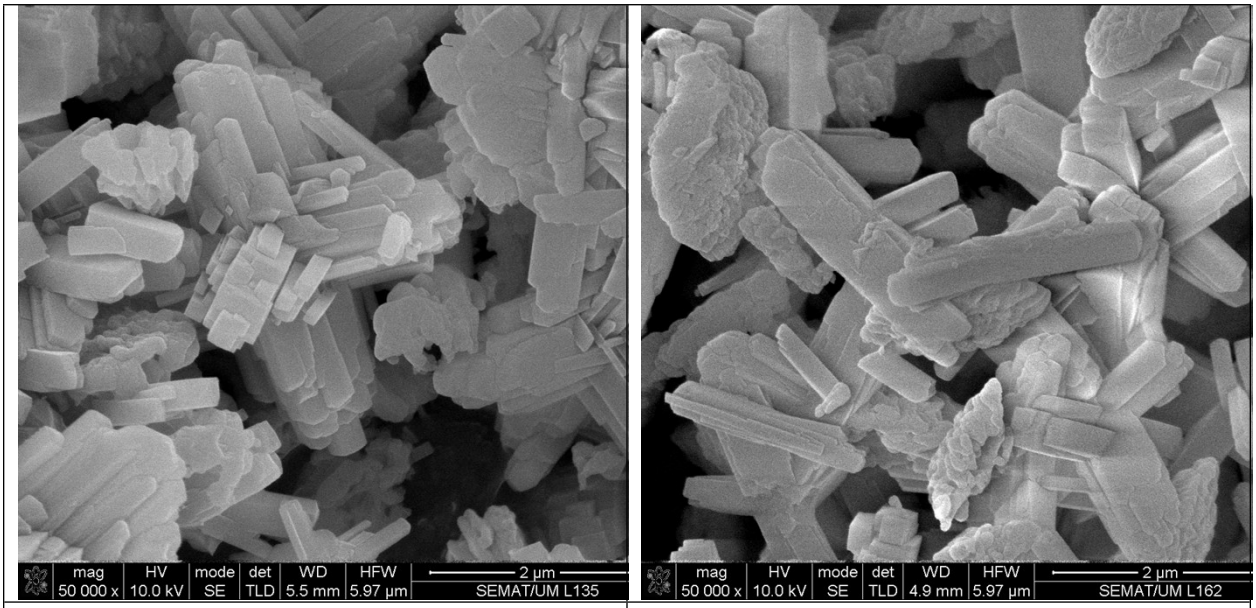


Figure S6. SEM image of partially dissolved **FAU** zeolite obtained at 140 °C for 15 min.



a) b)

Figure S7. SEM of **MER** zeolite obtained at (a) 150 ºC and (b) 160 ºC in the system:

0.5 g FAU-1 g KOH - 4.5 g H_2O for 15 min.

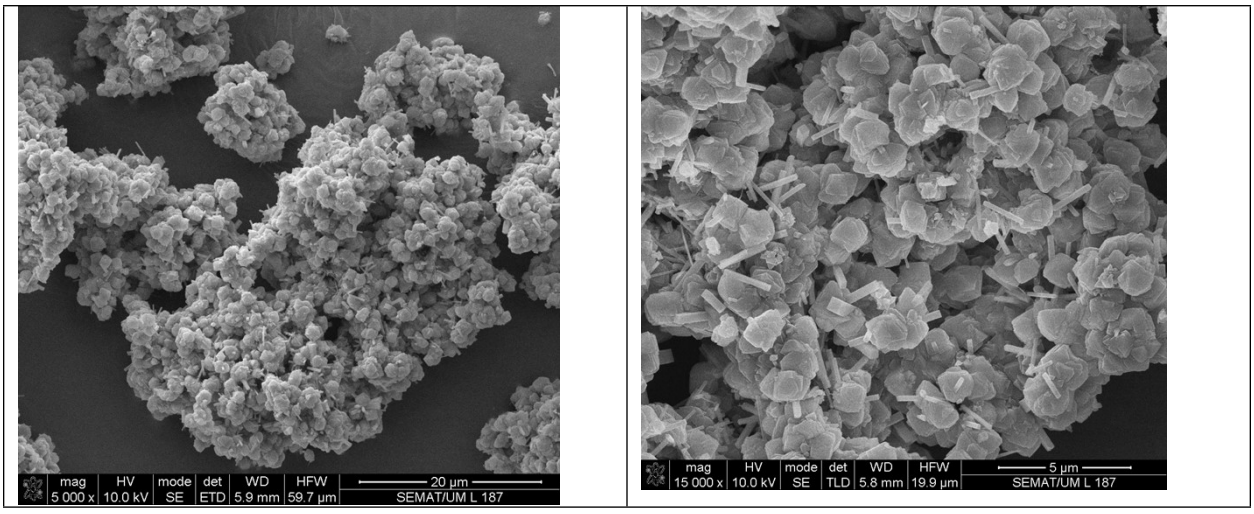


Figure S8. Different magnification images of **LTJ** zeolite obtained at 160 ºC for 15 min in the system: 0.15 g **FAU** – 1 g KOH – 4.5 g H_2O.

References

1. S. Ferdov, *Molecules (Basel, Switzerland)*, 2024, **29**, 1744.