Supporting Information

Revisiting the Seed-Assisted Synthesis of Zeolite without Organic Structure-Directing Agents: Insights from CHA case

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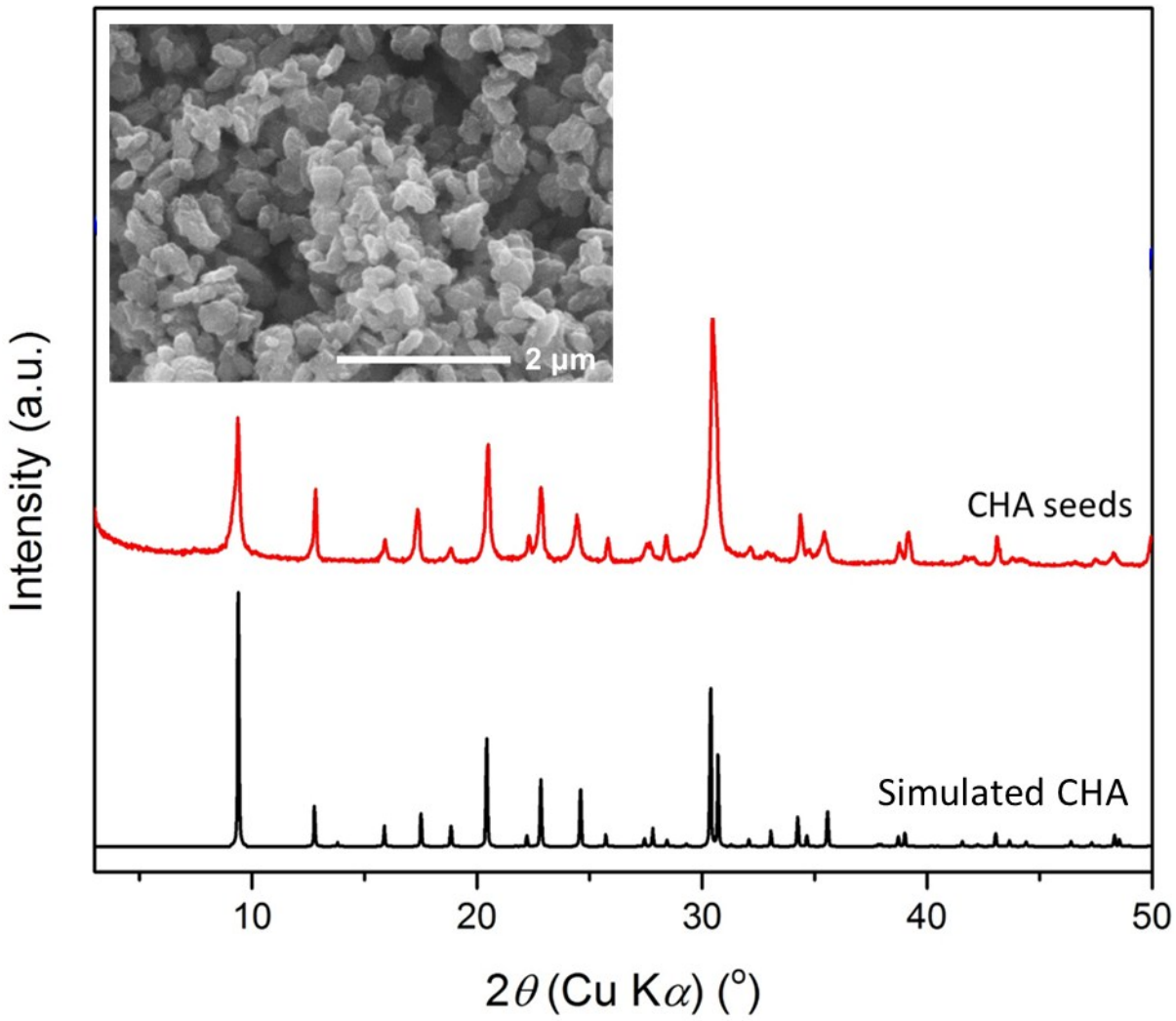

Figure S1. XRD patterns of CHA seeds obtained through the interzeolite conversion of FAU zeolite. Inset shows the SEM image of CHA seeds.

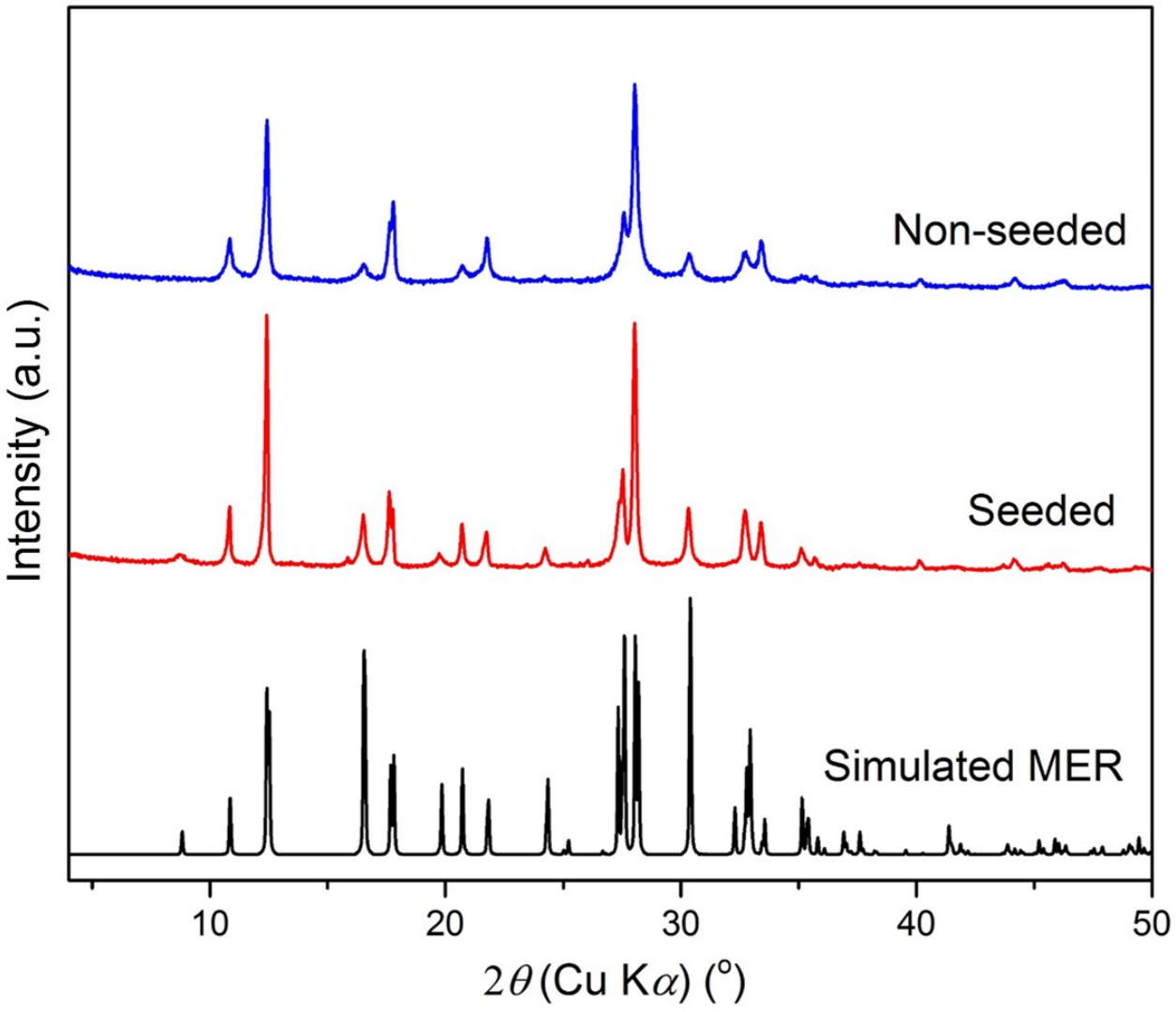

Figure S2. XRD patterns of products obtained through hydrothermal synthesis using the following molar compositions, 1 SiO_2: 0.05 Al_2O_3: 0.4 Na_2O: 0.4 K_2O: 100 H_2O, within and without the presence of CHA seeds, at 170 °C for 24 h.

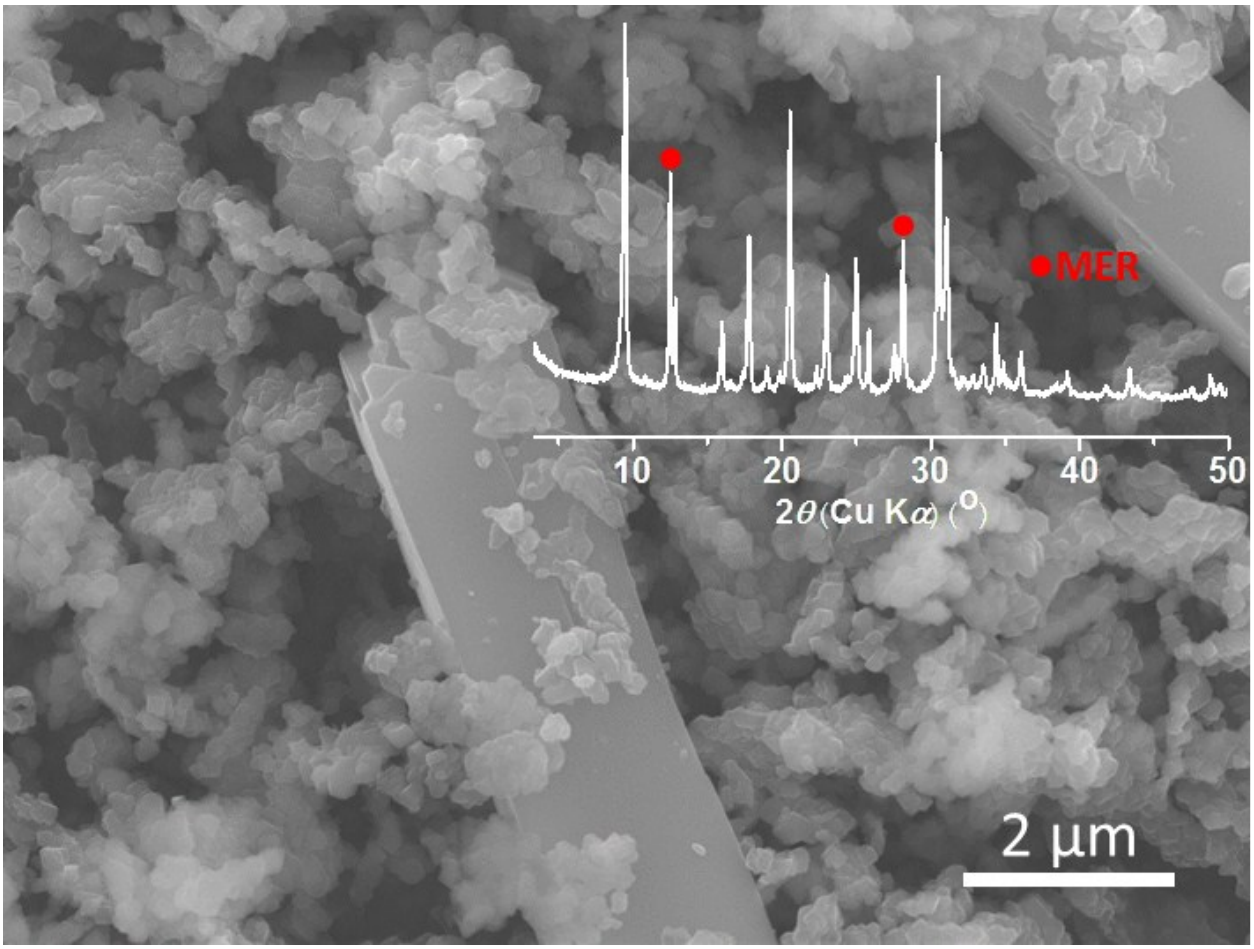

Figure S3. SEM image and XRD pattern of products obtained through seed-assisted synthesis using the following molar compositions, , 1 SiO_2: 0.05 Al_2O_3: 0.1 Na_2O: 0.3 K_2O: 100 H_2O, at 170 °C for 24 h.

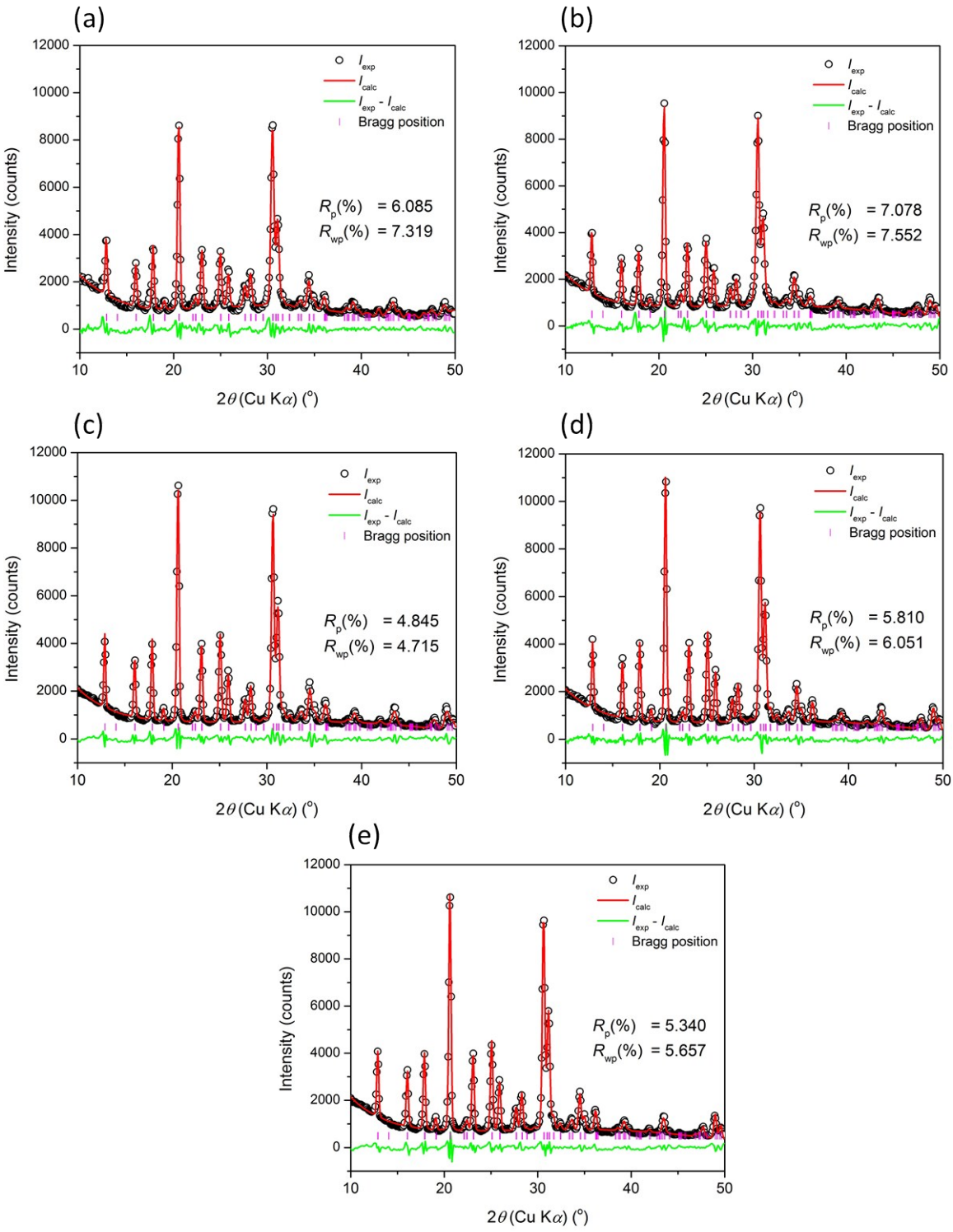

Figure S4. Whole pattern fitting using Le Bail method of XRD patterns of products obtained after (a) 6 h, (b) 8 h, (c) 12 h, (d) 18 h and (e) 24 h of hydrothermal treatment of initial mixtures with the following molar compositions, 1 SiO_2: 0.05 Al_2O_3: 0.3 Na_2O: 0.1 K_2O: 100 H_2O, at 170 °C.

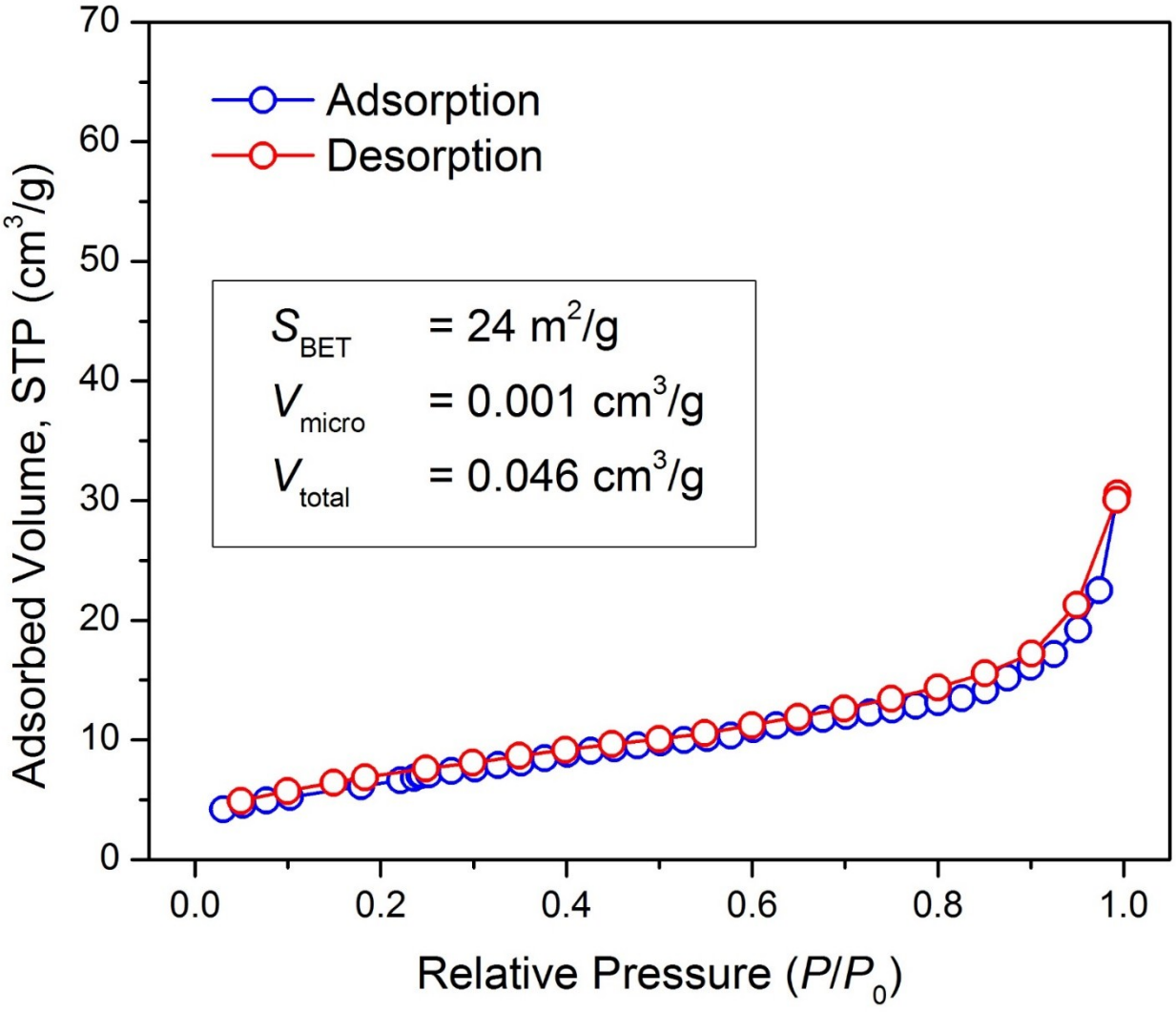

Figure S5. N_2 adsorption-desorption isotherm of CHA seeds.

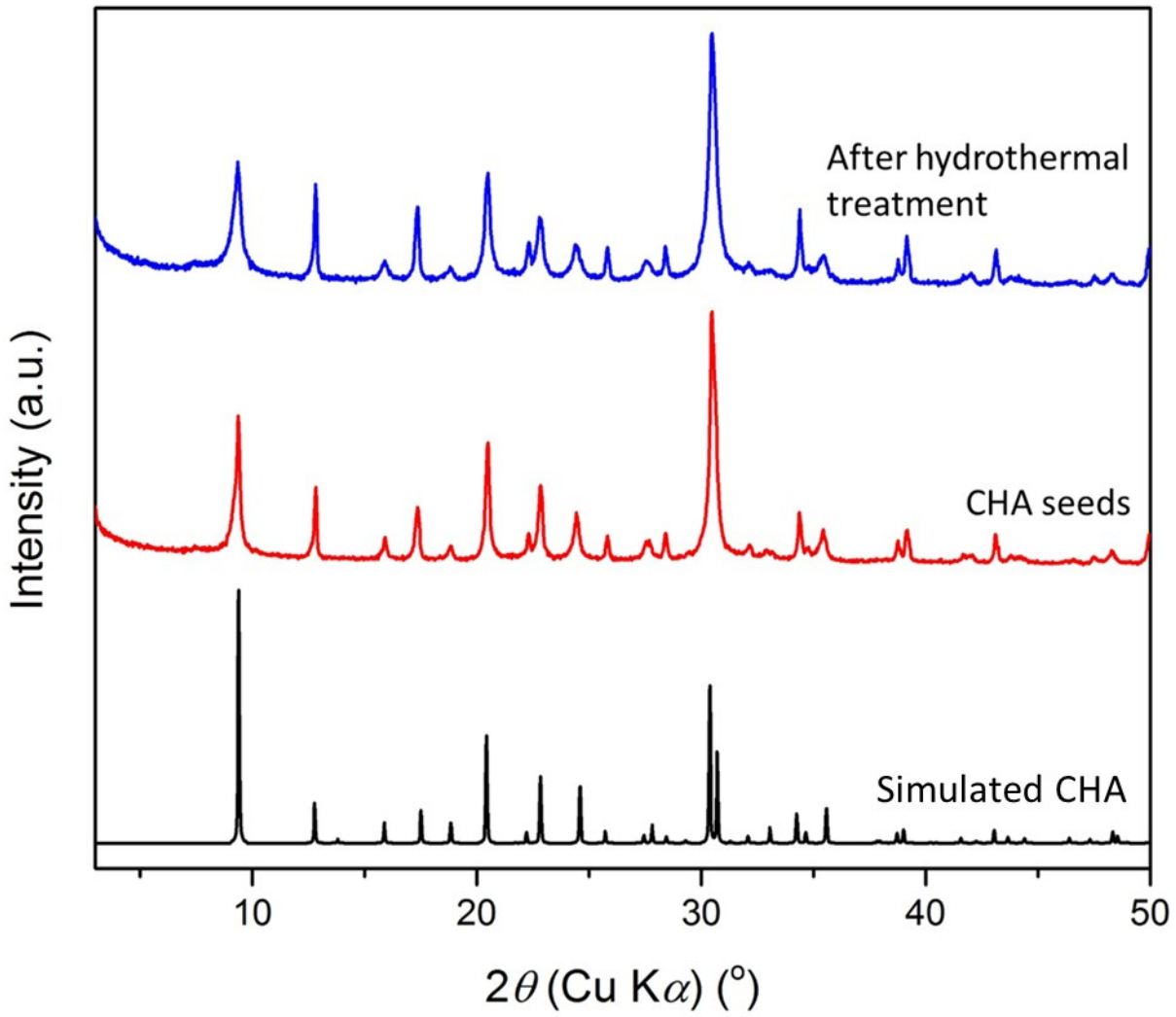

Figure S6. XRD patterns of CHA seeds before and after hydrothermal treatment using solution with the following molar compositions, 0.3 Na_2O: 0.1 K_2O: 100 H_2O, at 170 °C for 6 h.

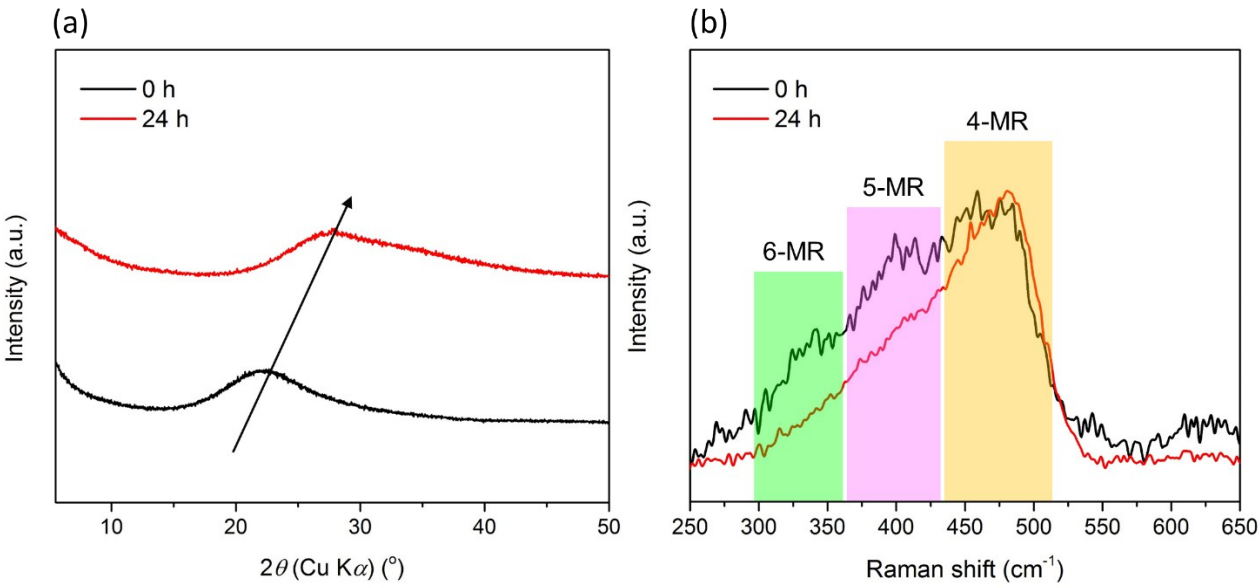

Figure S7. (a) XRD patterns and (b) Raman spectra of products obtained through hydrothermal synthesis using the following molar compositions, 1 SiO_2: 0.05 Al_2O_3: 0.3 Na_2O: 0.1 K_2O: 100 H_2O, without the presence of CHA seeds, at 170 °C for 0 and 24 h.

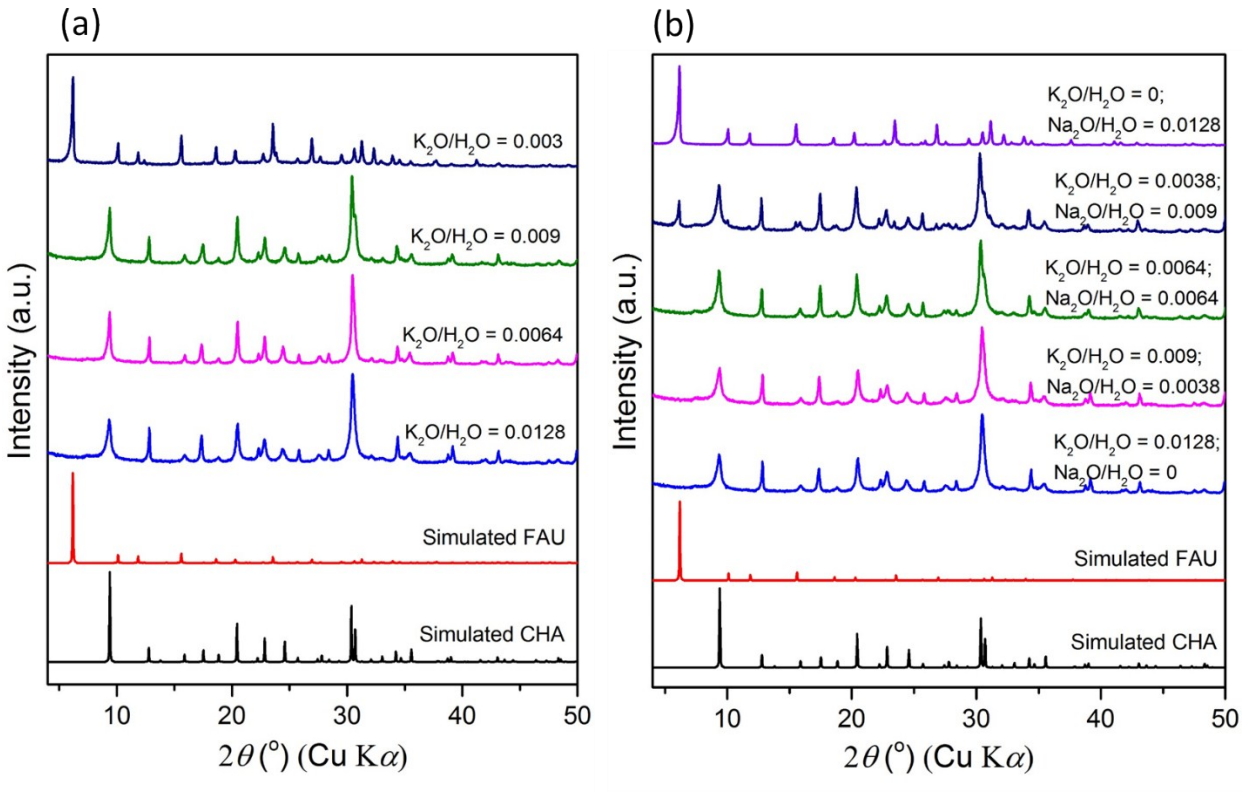

Figure S8. XRD patterns of products obtained from attempts on interzeolite conversion of FAU to CHA using solutions with the following molar compositions, (a) 0.003-0.0128 K_2O: 1 H_2O and (b) 0-0.0128 Na_2O: 0-0.0128 K_2O: 1 H_2O with fixed alkalinity, i.e. $(K_2O+Na_2O)/H_2O$ = 0.0128, heated at 95 °C for 96 h.

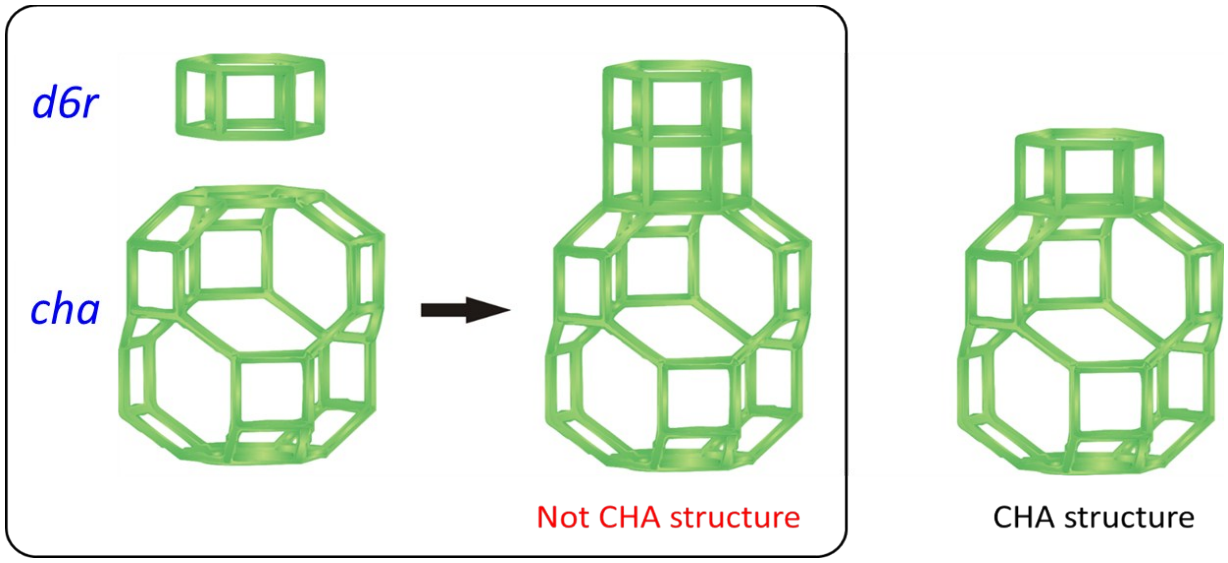

Figure S9. Illustration of the formation of a structure if *t-hpr* and *t-cha* are combined. CHA structure is shown for comparison.

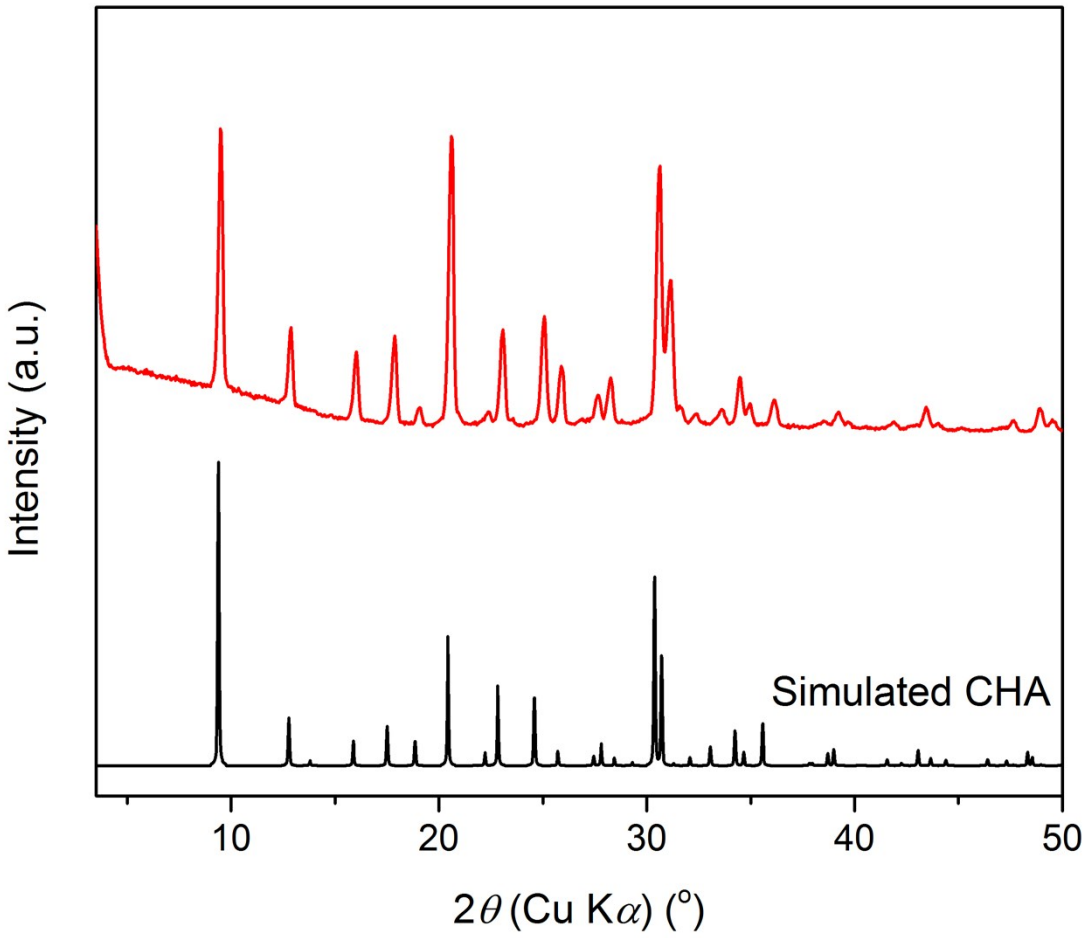

Figure S10. XRD patterns of products obtained zeolite through the seed-assisted synthesis, in which the employed seeds are CHA zeolite obtained through the previous seed-assisted synthesis.