Supplementary Materials

CHA-type zeolite prepared by interzeolite conversion method using FAU and LTL-type zeolite: effect of the raw materials on the crystallization mechanism, and physicochemical and catalytic properties

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(a) LTL (HSZ-500KOA (Si/Al = 3.0))

(b) FAU (JRC-Y-4.8 (Si/Al = 2.4))
Figure S1. Physicochemical properties of (a) LTL (HSZ-500KOA (Si/Al = 3.0)), (b) FAU (JRC-Y-4.8 (Si/Al = 2.4)) and (c) seed crystal (CHA-type zeolite) used as parent zeolite for the synthesis of CHA.
Figure S2. XRD patterns of (a) CHA-LTL-TMAda, (b) CHA-FAU-TMAda, (c) CHA-LTL-TEA, (d) CHA-FAU-TEA.

Figure S3. $^{27}$Al MAS NMR spectra of the calcined Na-type products: (a) CHA-FAU-TMAda, (b) CHA-LTL-TMAda, (c) CHA-LTL-TEA, (d) CHA-FAU-TEA.
**Figure S4.** $^{27}$Al MAS NMR spectra of the H$^+$ type products: (a) CHA-FAU-TMAda, (b) CHA-LTL-TMAda, (c) CHA-FAU-TEA, (d) CHA-LTL-TEA.

**Table S1.** The products’ selectivities in the MTO reaction over CHA-LTL-TMAda, CHA-FAU-TMAda, CHA-LTL-TEA, and CHA-FAU-TEA.

| Catalyst          | Acid amount$^a$ / mmol g$^{-1}$ | TOS$_{95}^b$ / min | Product selectivity (C-atom %)$^b$ | Paraffins (C1-C4) | DME | Over C5 |
|-------------------|----------------------------------|--------------------|-----------------------------------|-------------------|-----|---------|
| CHA-LTL-TMAda     | 0.46                             | 180                | 56.7 28.8 6.4 6.0                  | 0.3               | 1.9 |
| CHA-FAU-TMAda     | 0.47                             | 240                | 55.9 28.9 7.7 4.7                  | 2.0               | 0.9 |
| CHA-LTL-TEA       | 0.80                             | 180                | 51.6 33.4 6.3 4.6                  | 2.8               | 1.3 |
| CHA-FAU-TEA       | 1.17                             | 120                | 48.0 30.8 5.9 5.2                  | 8.9               | 1.1 |

$^a$; Estimated by the NH3-TPD, $^b$; TOS$_{95}$ indicates TOS (time on Stream) required to achieve methanol conversion drop below 95%.