Electronic Supplementary Information (ESI)

Template-free Synthesis and Structural Evolution of Discrete

Hydroxycancrinite Zeolite Nanorods from High-Concentration Hydrogels

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Samples	SSA_{BET} (m ² /g)	$\frac{\text{SSA}^{a}_{\text{micro}}}{(\text{m}^{2}/\text{g})}$	$\frac{\text{SSA}^{a}_{\text{ext}}}{(\text{m}^{2}/\text{g})}$	$\begin{array}{c} V_{total.} \\ (cm^3/g) \end{array}$	V^{a}_{micro} (cm ³ /g)	V^{b}_{meso} (cm ³ /g)	Si/Al ^c
120 °C-0.5h	61.2	3.7	57.5	0.30	0.001	0.29	1.44
120 °C-1h	174	21.4	153	0.82	0.008	0.81	1.24
120 °C-3h	164	22.7	142	0.86	0.009	0.86	1.19
120 °C-6h	142	22.8	120	0.90	0.009	0.89	1.24
120 °C-24h	103	15.6	87.4	0.50	0.006	0.49	1.12
120 °C-7d	54.9	7.1	47.7	0.26	0.003	0.26	1.20

Table S1. The properties of the products formed at 120 °C after various reaction periods.

^{*a*}From *t*-plot method

^{*b*}BJH desorption cumulative volumes

^{*c*}From PIXE (particle induced X-ray emission)



Figure S1. (a) The high-resolution TEM image of 120C-0.5h product obtained under a low-dose electrons mode. The particles with red boundary lines are CAN nanocrystals; (b) enlarged images of three CAN nanocrystals in (a) and their corresponding fast Fourier transform (FFT). Lattice fringes in (b) correspond to the (110) lattice planes of the CAN crystal structure.



Figure S2. Length (L) and width (W) distributions of the products formed at 90 °C and 120 °C after various reaction periods.



Figure S3. TEM images of the products formed at 90 °C after various time periods of (a) 0.5, (b) 1, (c) 3, (d) 6, (e) 24 and (f) 48 h. The corresponding size aspect ratio distributions for 3h, 6h, 24h and 48h products are given in (g).



Figure S4. (a) Nitrogen sorption isotherms and (b) BJH desorption pore width distributions of the products formed at120 °C after various reaction periods.



Figure S5. Scanning electron microscopy (SEM) images of nanorods (120°C-168h product) from (a) a high-concentration dispersion (~0.6 wt%) and (b) a dilute dispersion (~0.1 wt%).



Figure S6. Powder X-ray diffraction (PXRD) patterns of 90°C-1h and 90°C-1h-18d (no mother liquor) samples along with simulated patterns of CAN and SOD. 90°C-1h-18d (no mother liquor) sample is obtained by heating the purified 90°C-1h sample in DI water at 90 °C for 18 days. The PXRD patterns are almost identical between 90°C-1h and 90°C-1h-18d (no mother liquor) products. Peak (*) is due to anatase impurity in metakaolin.