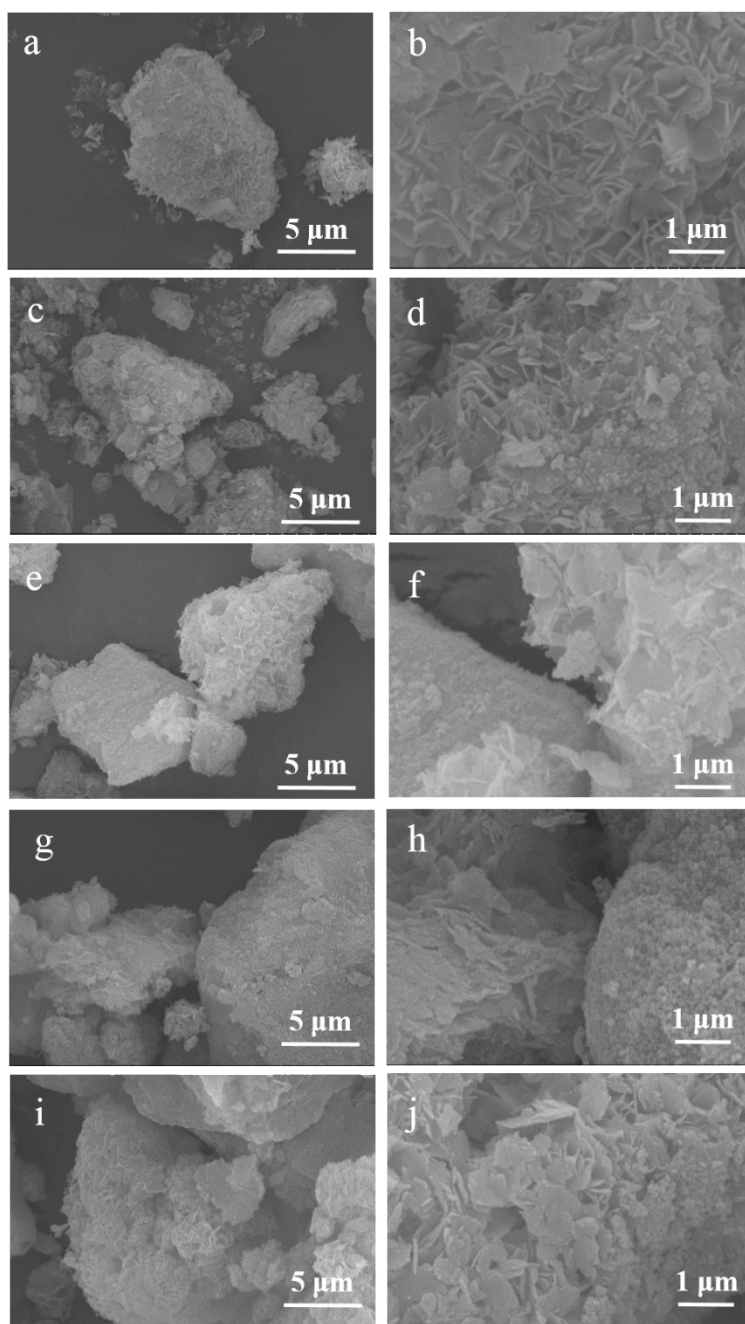
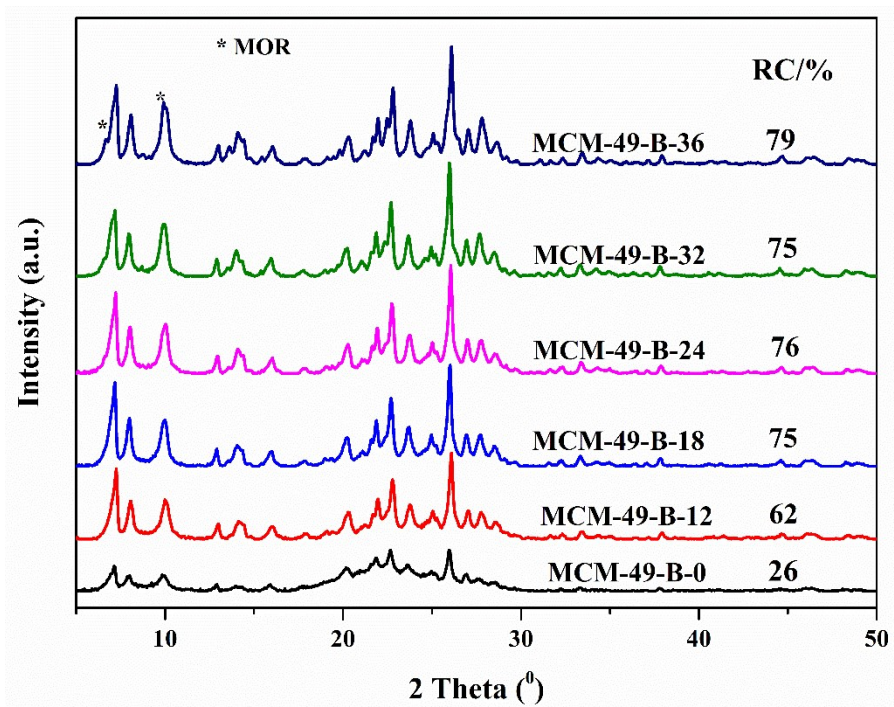


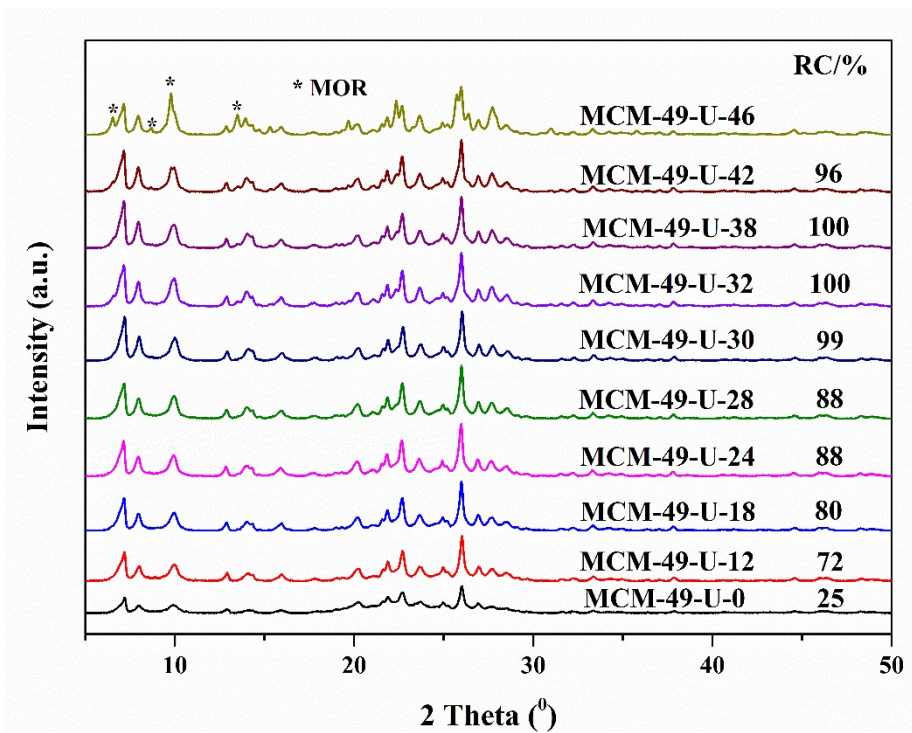
SUPPORTING INFORMATION



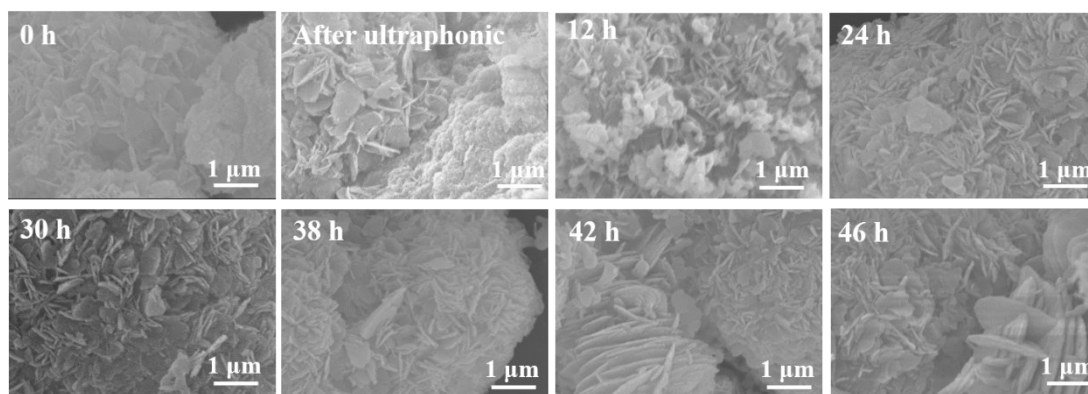
**Figure S1** SEM images of Seed and MCM-49-X-0 (a, b: Seed; c, d: MCM-49-B-0; e, f: MCM-49-U-0; g, h: MCM-49-S-0; i, j: MCM-49-M-0)



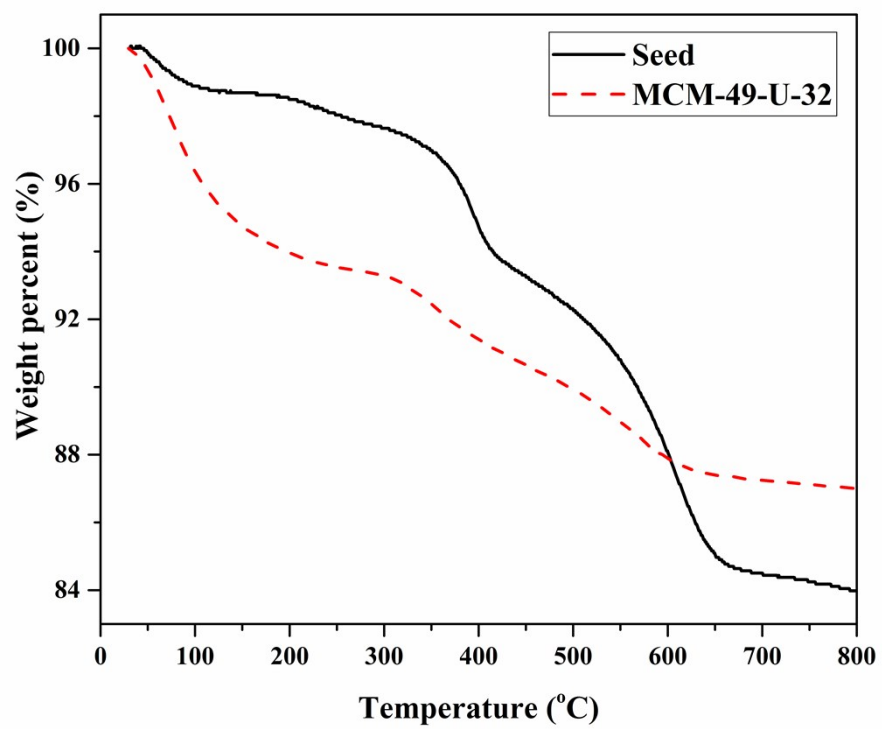
**Figure S2** Crystallization process of the synthesis systems without aging treatment



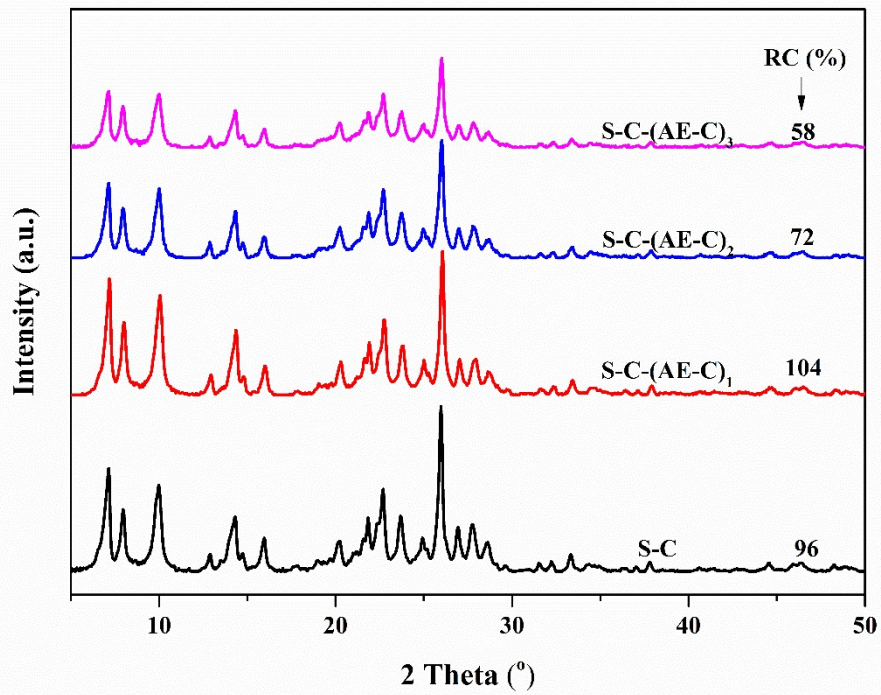
**Figure S3** Crystallization process of the synthesis systems with ultrasonic aging treatment



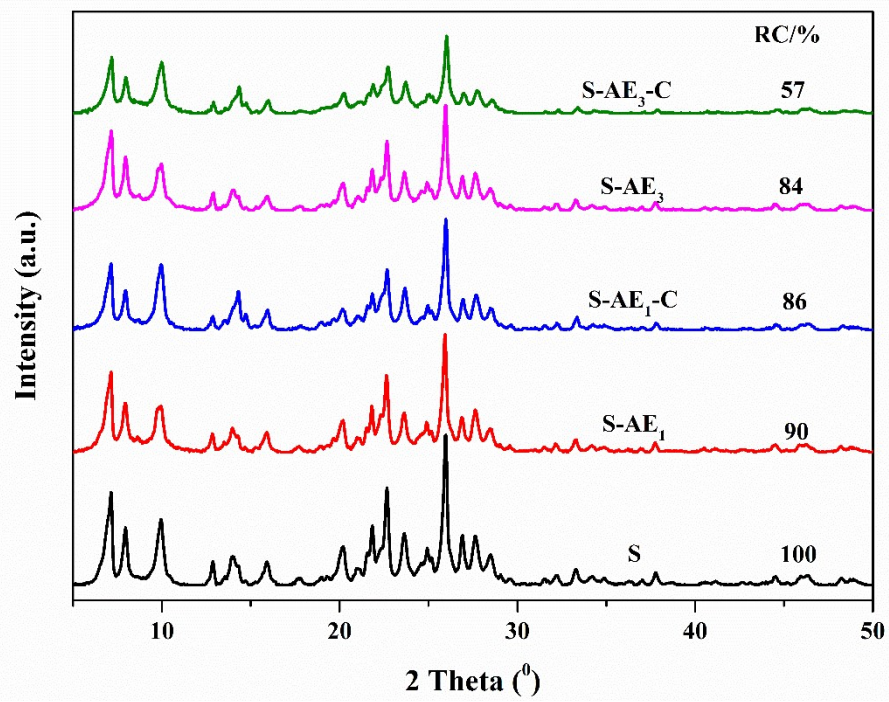
**Figure S4** SEM images of crystallization process of MCM-49-U-*t*



**Figure S5** TG analysis of Seed and MCM-49-U-32



**Figure S6** XRD patterns of S-C and S-C-(AE-C)<sub>x</sub>



**Figure S7** XRD patterns of S-C, S-AE<sub>x</sub>, and S-AE<sub>x</sub>-C

**Table S1** SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> molar ratio (SAR) and solid yield of MCM-49-*X*-32

Samples	MCM-49-B-32	MCM-49-U-32	MCM-49-S-32	MCM-49-M-32
SAR	15.2	15.3	15.2	15.8
Solid yield (%)	40.3	37.3	41.0	42.2

**Table S2** Acidity of various samples by NH<sub>3</sub>-TPD.

Samples	Acid concentration with various strength (mmol/g)			Total acid concentration (mmol/g)	SAR*
	Weak	Medium	Strong		
H-Seed	0.317	0.331	0.137	0.785	18.8
S-C-(AE-C) <sub>2</sub>	0.231	0.173	0.055	0.459	15.1
S-AE <sub>1</sub> -C	0.291	0.262	0.125	0.678	15.0
S-AE <sub>3</sub> -C	0.244	0.244	0.133	0.621	15.1

\* SAR was calculated from XRF results.