SUPPLEMENTARY INFORMATION:

An efficient synthetic route to accelerate the zeolite synthesis via

radicals

Peng Cheng,^a Guodong Feng,^a Chang Sun,^a Wenjing Xu,^a Ji-Hu Su,^b Wenfu Yan*^a and Jihong Yu*^{a,c}

^aState Key Laboratory of Inorganic Synthesis and Preparative Chemistry, College of Chemistry, Jilin University, 2699 Qianjin Street, Changchun 130012, China.

^bCAS Key Laboratory of Microscale Magnetic Resonance and Department of Modern Physics, University of Science and Technology of China, 96 Jinzhai Road, Hefei, 30026, China.

^cInternational Center of Future Science, Jilin University, 2699 Qianjin Street, Changchun 130012, China.

Corresponding authors' E-mails: jihong@jlu.edu.cn; yanw@jlu.edu.cn



Fig. S1 N_2 adsorption isotherms of (A) product synthesized with 0.02 M SPS at 16 h, (B) product with 0.04 M SPS at 16 h, and (C) product synthesized with no SPS at 24 h.



Fig. S2 The XRD patterns of silicalite-1 with the extension of crystallization time under different SPS and the corresponding crystallization curves. The crystallinity is defined as the ratio of the integrated area of the peaks between $2\theta=23.00^{\circ}$ and 25.00° of the sample respect to a well-crystallized standard sample.



Fig. S3 (A) Evolution of the particle size and (B-F) SEM images of the solid products for the batches of synthesis: (B) 0 M SPS at 24 h; (C) 0.005 M SPS at 24h; (D) 0.01 M SPS at 24 h; (E) 0.02 M SPS at 16 h; (F) 0.04 M SPS at 16 h.



Fig. S4 EPR spectra of water only and aqueous solution of SPS containing the spintrapping agent of BMPO.



Fig. S5 XRD patterns of the solid products crystallized for different periods in the presence of SPS with different concentrations (colloidal SiO₂ as silicon source).



Fig. S6 Yields of the solid products for the batches of synthesis as the function of time (colloidal SiO_2 as silicon source). The yield is defined the ratio of the weight of the calcined solid products and the weight of the SiO_2 form of the silicon source.



Fig. S7 (A) EPR spectra of the initial mixture (colloidal SiO_2 as silicon source) containing the spin-trapping agent of BMPO and the SPS with various concentrations (0, 0.005, 0.01, 0.02, and 0.04 M) and (B) the intensity of the EPR signals as the function of the concentration of SPS. The EPR signals are marked as following: red circles-hydroperoxyl radicals; green rectangles-alkyl radicals.



Fig. S8 Yields of the solid products for the batches of synthesis as the function of time under normal condition, without ethanol, and without ethanol but with 0.02 M SPS conditions.



Fig. S9 XRD patterns of the solid products crystallized at 24 h under normal, with half of normal amount of TPAOH, and with half of the amount of TPAOH and the SPS (0.02 M) conditions.

	0 M	0.005M	0.01 M	0.02 M	0.04 M
Before crystallization	12.54	12.53	12.54	12.56	12.52
After crystallization	12.60	12.83	12.85	12.84	12.82

Table S1 pH values of the mixtures with different amounts of $Na_2S_2O_8$ before and after the crystallization