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Supporting Information for

Direct synthesis of high-silica nano ZSM-5 aggregates with controllable mesoporosity and its enhanced catalytic properties

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1.Tables

Table S1 The SiO_2/Al_2O_3 and solid yields of NA-X, C-ZSM-5 and C_1-ZSM-5 samples.

samples	$SiO2/Al_2O_3$[a]	Solid yields (%)
NA-1	163	76.78
NA-2	159	72.59
NA-3	151	68.17
NA-4	147	59.37
C-ZSM-5	134	*
C1-ZSM-5	172	*

a SiO_2/Al_2O_3 molar ratio of the synthesized NA-X, C-ZSM-5 and C_1-ZSM-5 zeolites determined by ICP analysis.

2. Figures

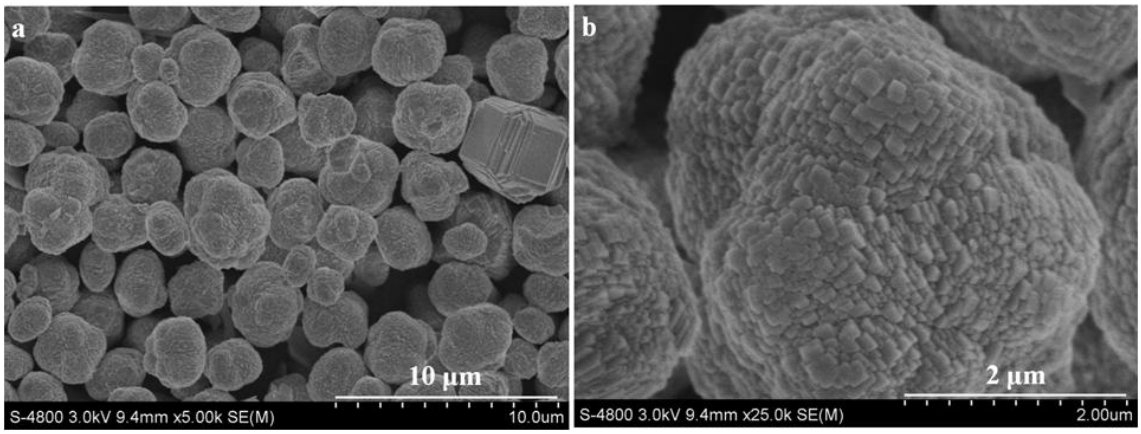

Fig. S1 SEM images for C-ZSM-5 zeolite (a) low magnification, (b) high magnification.

3.Results

3.1 Inductively-coupled plasma (ICP) analysis of synthesized samples

The total silica and aluminum contents in the synthesized samples(NA-X and C-ZSM-5) and the reference material C_1-ZSM-5 were determined by ICP analysis (Table S1, ESI). The SiO_2/Al_2O_3 ratios of NA-X(1-4)) and C-ZSM-5 samples were about 163, 159, 151,147, 134, 172 when a batch SiO_2/Al_2O_3 ratio of 168 was used, which are slightly lower than the theoretical values in the preparative gels. This may be because of the lower availability of silica than alumina in the alkaline medium during their synthesis.[1] The SiO_2/Al_2O_3 ratio of C_1-ZSM-5 (172) was higher than the nominal ratio in the starting material (167), which indicates that the Si atoms in synthetic solutions were easier to incorporate into the framework structures of the C_1-ZSM-5 zeolite than Al atoms in its hydrothermal synthesis.

Notes and references

1 T. Xue, Y. M. Wang, M.-Y. He, Solid State Sci., 2012, 14, 409–418.