Electronic Supporting Information

**Improvement in the catalytic properties of ZSM-5 zeolite nanoparticles via mechanochemical and chemical modifications**

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**Figure S1** Catalytic cracking of 1,3,5-triisopropylbenzene or cumene at 300 °C over (a) ZSM-5 nanoparticles (Si/Al = 21.1), and (b) acid-treated ZSM-5 nanoparticles (Si/Al = 49.7). Reaction conditions: weight of catalyst, 20 mg; pellet size, 500–600 µm; TIPB, 0.6 µL; cumene, 0.8 µL; He gas flow rate, 30.0 cm³(N.T.P.) min⁻¹.
**Figure S2** Product yields in hexane cracking at 650 °C over various ZSM-5 catalysts after adjusting the conversions at a similar level.

(a) Milled and recrystallized ZSM-5 nanoparticles (Si/Al = 21.1, 100 mg, W/F = 19.8 g h mol⁻¹); the same data as shown in Fig. 6e. The coke amount on the spent catalyst was 65.1 mg-coke/g-catalyst.

(b) Milled and recrystallized ZSM-5 nanoparticles (Si/Al = 21.1, 50 mg, W/F = 9.9 g h mol⁻¹). The coke amount on the spent catalyst was 23.9 mg-coke/g-catalyst.

(c) Milled, recrystallized and acid-treated ZSM-5 nanoparticles (Si/Al = 49.7, 100 mg, W/F = 19.8 g h mol⁻¹); the same data as shown in Fig. 6f. The coke amount on the spent catalyst was 7.2 mg-coke/g-catalyst.