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Electronic Supporting Information

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

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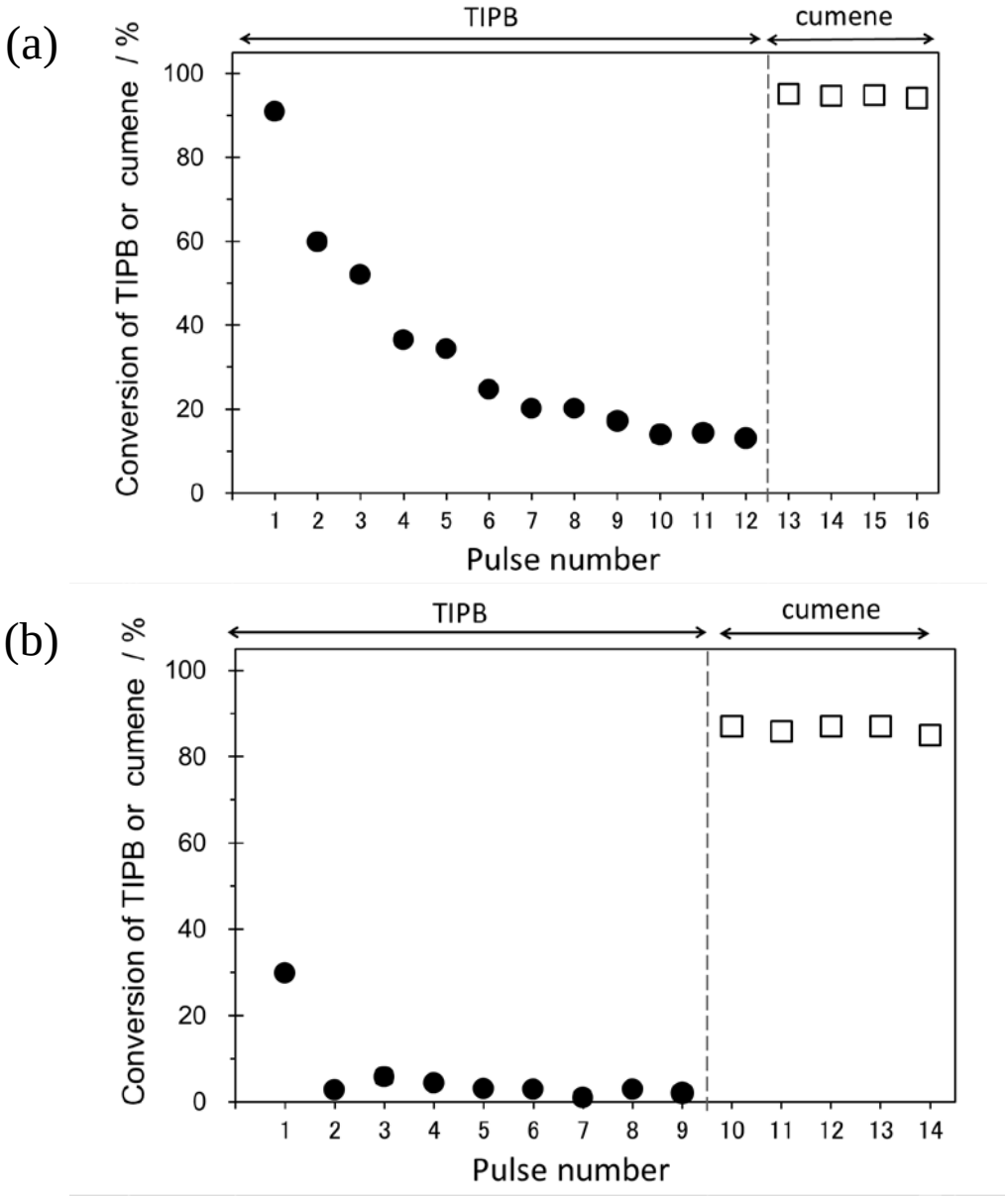

Figure S1 Catalytic cracking of 1,3,5-triisopropylbenzene or cumene at 300 ºC over (a) ZSM-5 nanoparticles (Si/Al = 21.1), and (b) acid-treated ZSM-5 nanoparticles (Si/Al = 49.7).
Reaction conditions: weight of catalyst, 20 mg; pellet size, 500−600 μm; TIPB, 0.6 μL; cumene, 0.8 μL; He gas flow rate, 30.0 cm^3(N.T.P.) min^{-1}.

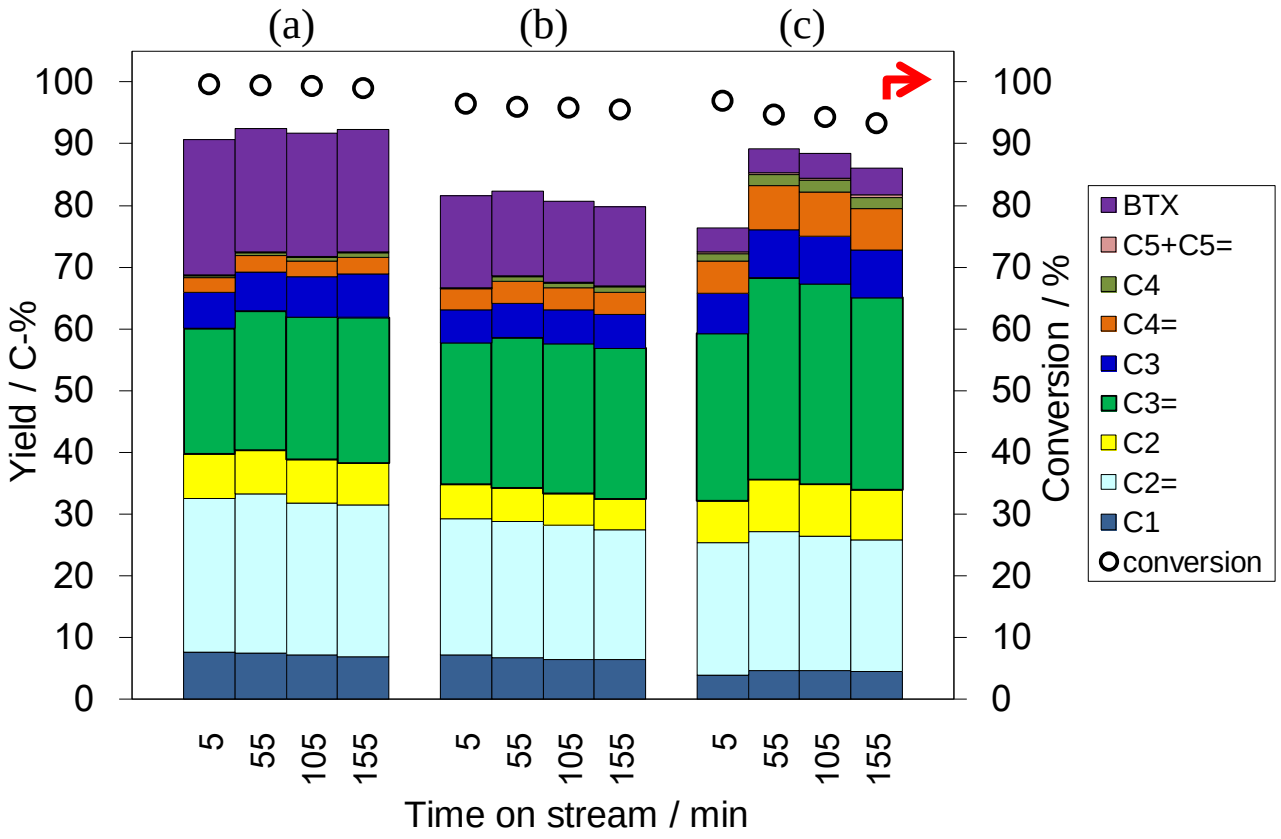

Figure S2 Product yields in hexane cracking at 650 °C over various ZSM-5 catalysts after adjusting the conversions at a similar level.

(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.