Supplementary material

Fluorine-enhanced Pt/ZSM-5 catalysts for low-temperature oxidation of ethylene

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1.1. Catalyst characterization

O_2–TPD was conducted in a Micromeritics Chemisorb 2720 apparatus. Before TPD run, 100 mg of catalyst was pretreated in helium (He) at a flow rate of 50 $mL \cdot min^{-1}$ at 300°C for 1 h in a quartz U-tube reactor and then cooled to room temperature. The adsorption process was performed by exposing the catalyst to a 50$mL \cdot min^{-1}$ flow of 5% O_2/He for 30 min. Then, He was fed into the reactor at 50 $mL \cdot min^{-1}$ for 30 min to purge residual O_2. The O_2-TPD was performed by heating the catalyst from 25 °C to 600 °C at a constant heating rate of 10 $°C \cdot min^{-1}$ under He flow of 50 $mL \cdot min^{-1}$. The desorbed O_2 was monitored with a thermal conductivity detector.

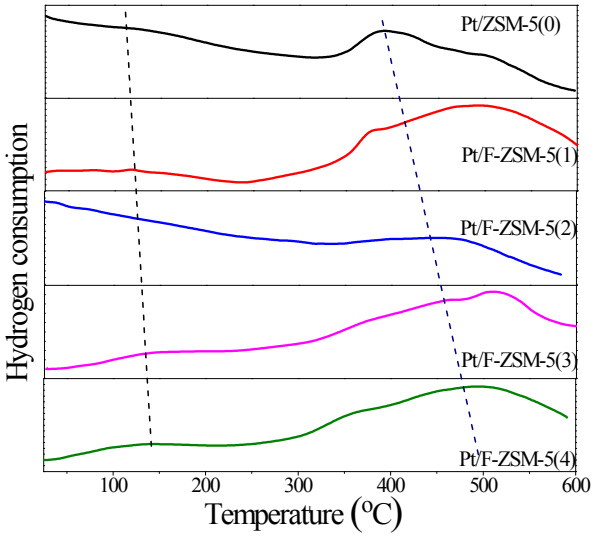

Fig. S1 H_2-TPR profiles of Pt/ZSM-5(0) and Pt/F-ZSM-5 catalysts.

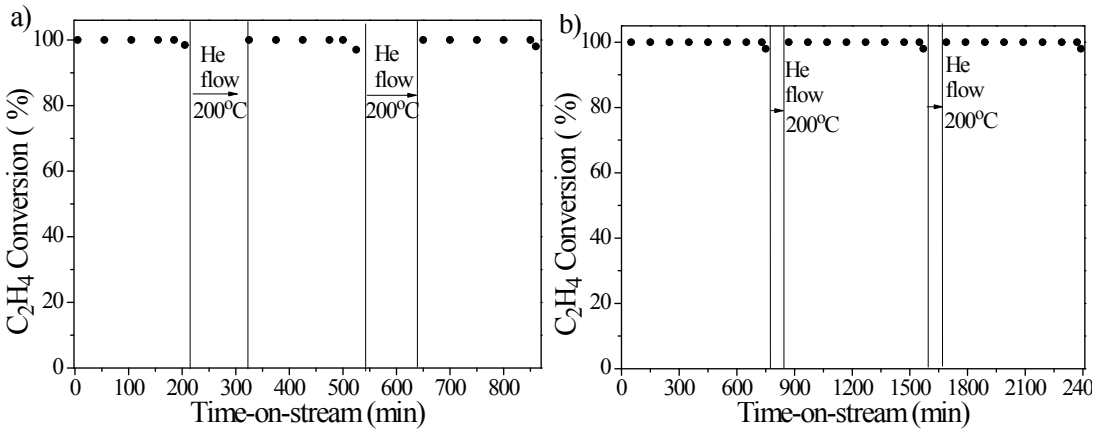

Fig.S2 Catalytic performances of (a) Pt/ZSM-5(0) and (b) Pt/F-ZSM-5(2) catalysts at 25°C; Space velocity: 7500 $mL \cdot h^{-1} \cdot g^{-1}$; catalyst: 0.20 g; C_2H_4: 100 ppm; O_2: 21 vol %; He balance.

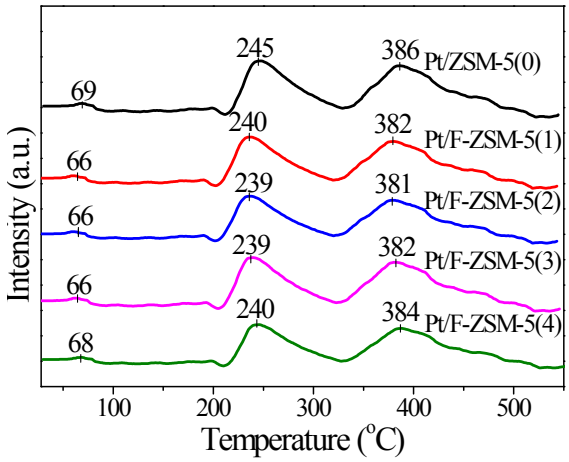

Fig. S3 O_2-TPD profiles of Pt/ZSM-5(0) and Pt/F-ZSM-5 catalysts.