

Supplementary Information

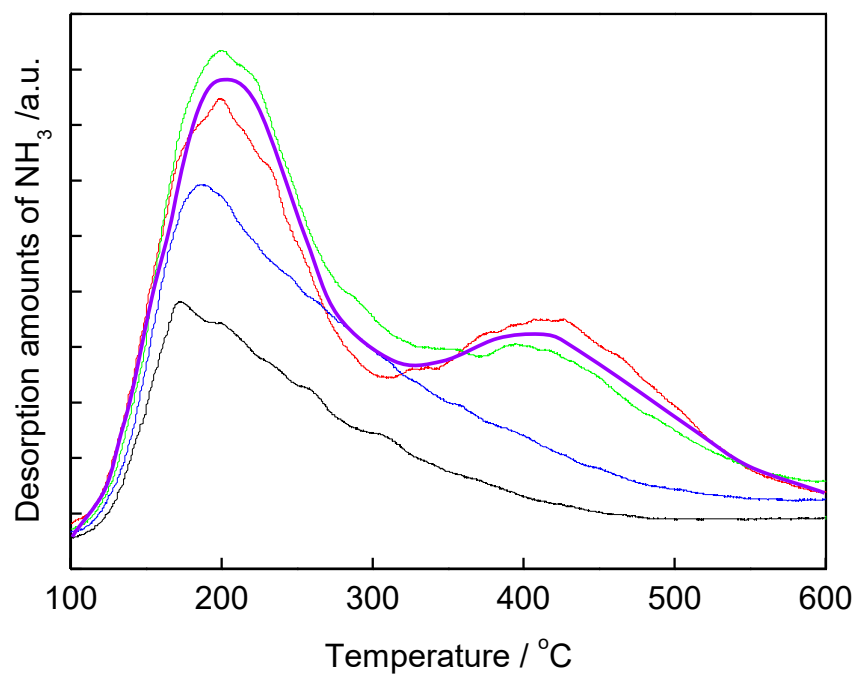


Figure S1. NH_3 -TPD profiles of H-ZSM-5(80) catalysts calcined at different temperatures. Calcination temperature: red line 500 $^{\circ}\text{C}$, purple line 600 $^{\circ}\text{C}$, green line 700 $^{\circ}\text{C}$, blue line 800 $^{\circ}\text{C}$, black line 900 $^{\circ}\text{C}$.

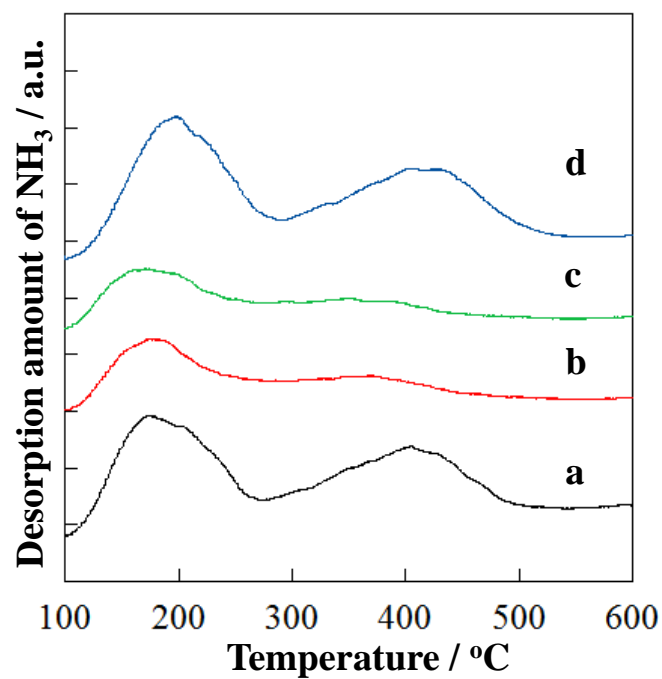


Figure S2. NH_3 -TPD profiles of H-ZSM-5(80) catalysts of fresh and post reaction (8 h reaction) H-ZSM-8(80) catalysts. Feed composition: **a.** fresh catalyst; **b.** ethanol reaction (Ethanol: N_2 =1:1); **c.** ethylene and water reaction (ethylene : water : N_2 =1: 1: 1); **d.** ethylene reaction (Ethylene: N_2 =1 : 2).