

Supporting Information

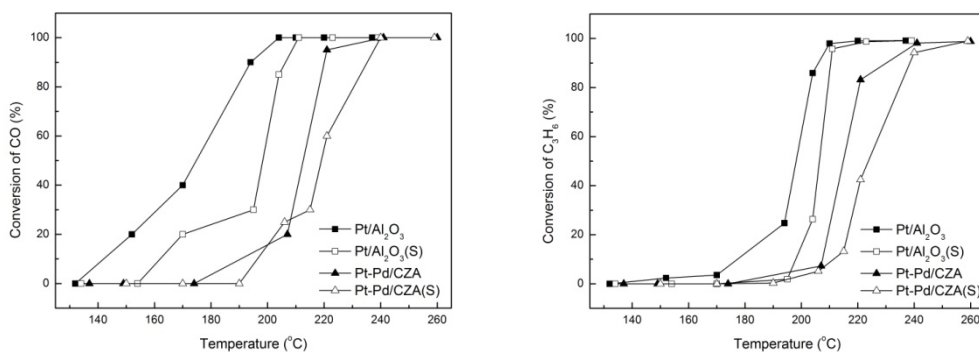


Fig. 1. The CO (left) and C₃H₆ (right) oxidation conversion over fresh Pt/Al₂O₃, Pt-Pd/CZA and sulfur-poisoning treated Pt/Al₂O₃(S), Pt-Pd/CZA(S) catalysts.

Reaction conditions: C₃H₆: 330 ppm, CO: 1000 ppm, NO: 200 ppm, O₂: 10%, CO₂: 8%, vapor: 7%, SO₂: 50 ppm, N₂: balance, GHSV = 60,000 h⁻¹. All catalysts were pre-treated at 500 °C for 3h under the reaction atmosphere.

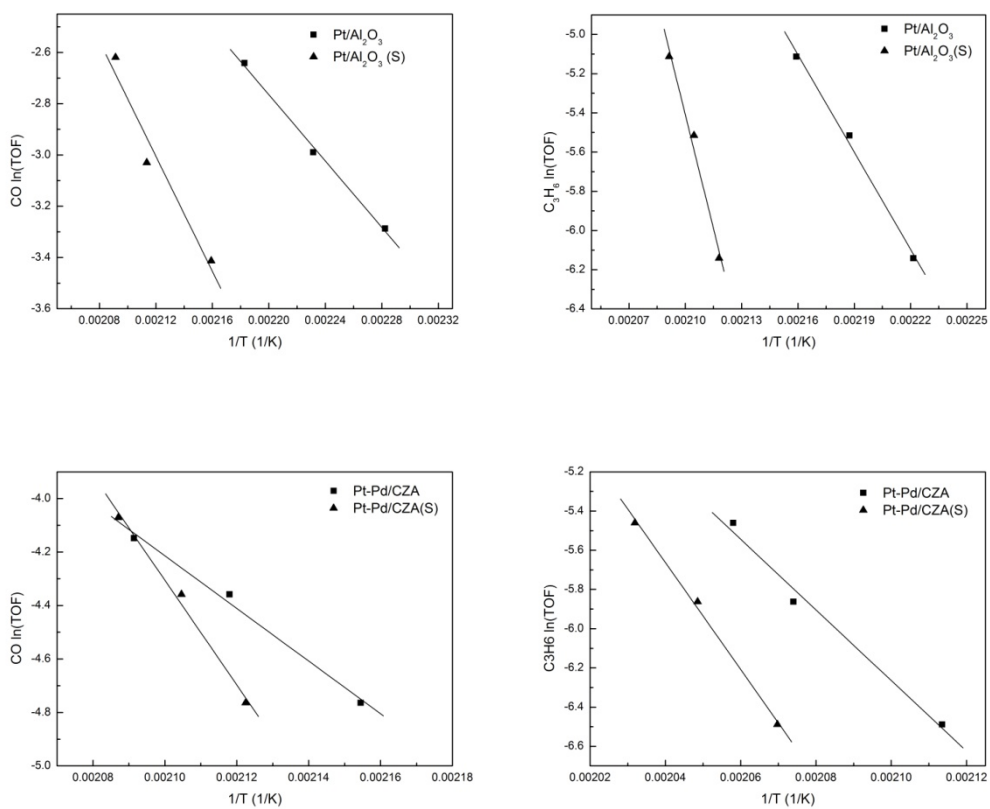


Fig. 2. Arrhenius plots of the turnover frequency (TOF) with respect to the total Pt amount on Pt/Al₂O₃, Pt-Pd/CZA, Pt/Al₂O₃(S) and Pt-Pd/CZA(S) catalysts.

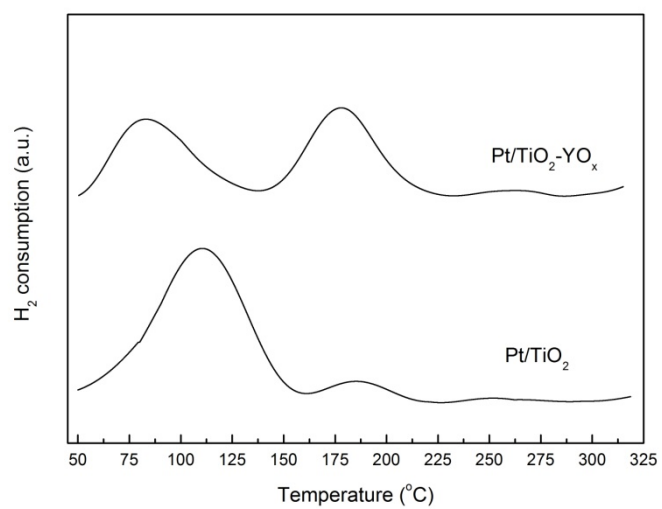


Fig. 3. H₂-TPR profiles of the Pt/TiO₂ and Pt/TiO₂-YO_x catalysts.

Table 1. CO and C₃H₆ reaction rates and apparent activation energies over Pt/Al₂O₃, Pt-Pd/CZA, Pt/Al₂O₃(S) and Pt-Pd/CZA(S) catalysts.

Catalyst	Reaction rate (mol g ⁻¹ s ⁻¹)		TOF (s ⁻¹)		Ea (kJ mol ⁻¹)	
	CO + O ₂	C ₃ H ₆ + O ₂	CO + O ₂	C ₃ H ₆ + O ₂	CO + O ₂	C ₃ H ₆ + O ₂
Pt/Al ₂ O ₃	^a 4.14×10 ⁻⁶	^b 9.21×10 ⁻⁷	0.0807 ^a	0.0179 ^b	53.9	116.4
Pt/Al ₂ O ₃ (S)	^a 1.70×10 ⁻⁶	^b 4.99×10 ⁻⁷	0.0331 ^a	0.0097 ^b	93.1	274.5
Pt-Pd/CZA	^c 3.02×10 ⁻⁶	^c 7.39×10 ⁻⁷	0.0416 ^c	0.0102 ^c	82.8	147.4
Pt-Pd/CZA(S)	^c 2.13×10 ⁻⁶	^c 5.54×10 ⁻⁷	0.0293 ^c	0.0049 ^c	145.7	230.7

The Pt content of Pt/Al₂O₃ and Pt/Al₂O₃(S) are 5.13×10⁻⁵ mol g⁻¹.

The active component content which respect to the total Pt and Pd amount on Pt-Pd/CZA and Pt-Pd/CZA(S) are 7.27×10⁻⁵ mol g⁻¹.

Pt-Pd/CZA is the abbreviation of Pt-Pd/CeO₂-ZrO₂-Al₂O₃ catalyst.

^a Catalyst bed temperature = 190 °C.

^b Catalyst bed temperature = 210 °C.

^c Catalyst bed temperature = 220 °C.