

Supporting Information

Pt supported on long rod β -FeOOH as an efficient catalyst for HCHO oxidation at ambient temperature†

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1. Experimental details of phenol spectrophotometric method

The phenol spectrophotometric method for analyzing the HCHO concentration in the gaseous mixture was performed as follows: The gas stream containing trace HCHO was bubbled through 5 mL phenol reagent ($C_6H_4SN(CH_3)C/NNH_2 \cdot HCl$, Alfa Aesar) solution (1×10^{-4} wt %) for 30 s to collect HCHO by absorption. Then, 0.4 mL (1 wt %) ammonium ferric sulfate ($NH_4Fe(SO_4)_2 \cdot 12H_2O$, Tianjin Fuchen Chemical Reagent Company) solution was added as the coloring reagent. After being shaken for 5 s and staying for 15 min in the dark, HCHO concentration in the gas stream was then determined by measuring light absorbance at 630 nm with a spectrophotometer (UV-240, Shimadzu Co. Ltd., Japan).

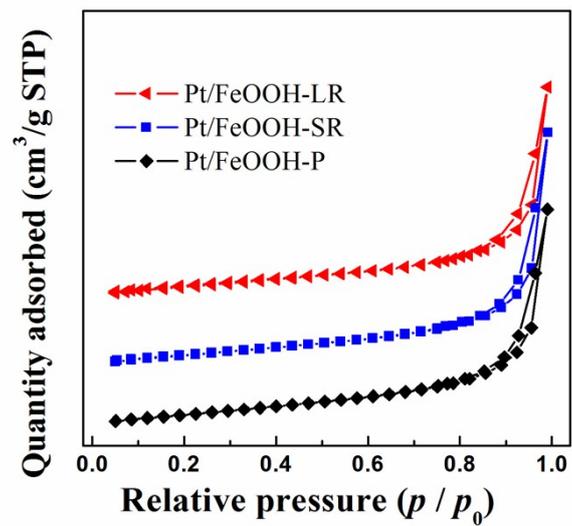


Fig S1 N₂ adsorption-desorption isotherms for the synthesized Pt/FeOOH samples.

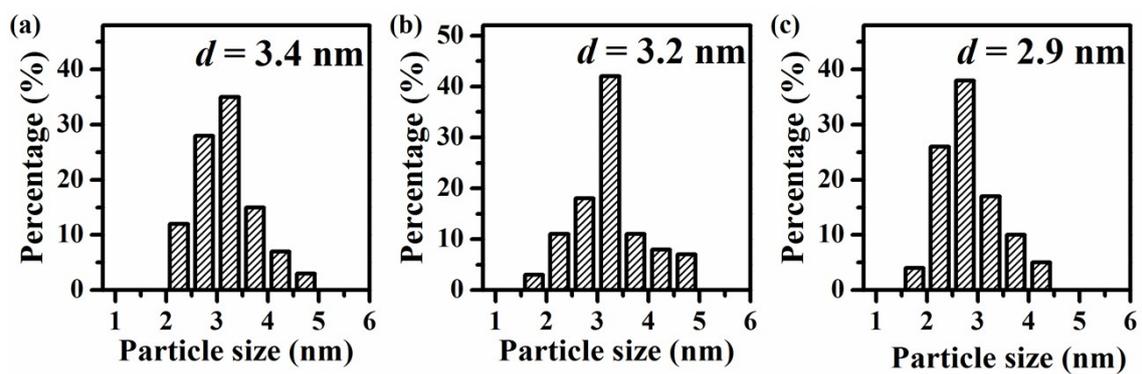


Fig S2 Pt particle size distributions for the (a) Pt/FeOOH-P, (b) Pt/FeOOH-SR and (a) Pt/FeOOH-LR.

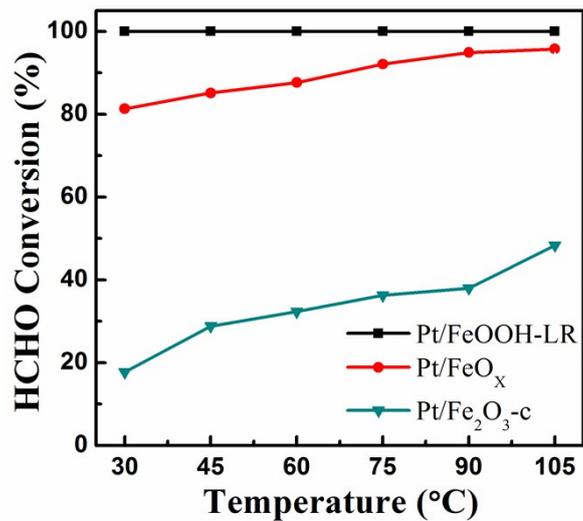


Fig. S3 HCHO conversion over Pt/FeOOH-LR, Pt/FeO_x and Pt/Fe₂O₃-c under various temperatures.

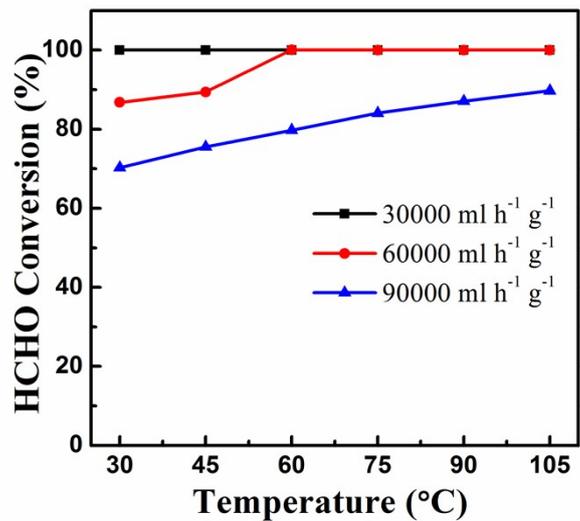


Fig. S4 HCHO conversions as a function of temperature at various GHSVs over Pt/FeOOH-LR.

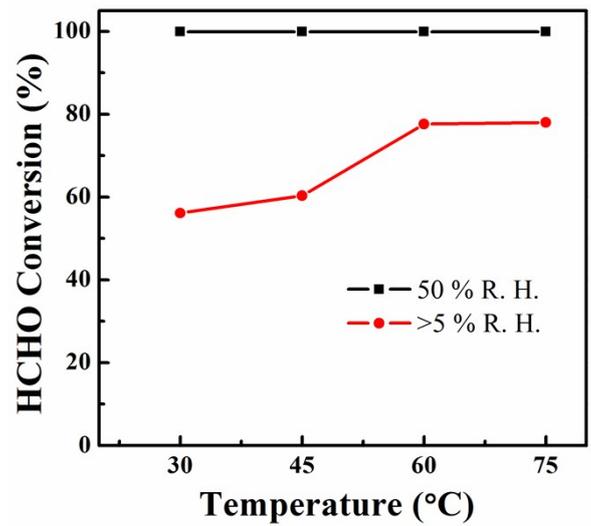


Fig S5 HCHO oxidation activity as a function of temperature under 50 % and < 5% R.

H. over Pt/FeOOH-LR

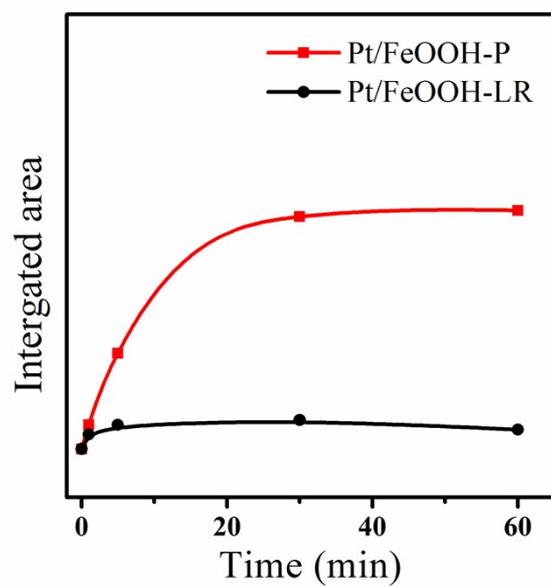


Fig. S6 Intensity of 1570 cm⁻¹ peak vs. time undre O₂ + HCHO + He gas mixture adsorption at 30 °C.