Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Probing the surface oxide formations on the SiO_2-supported platinum nanocatalysts under CO oxidation

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KEYWORDS: DRIFTS, Pt nanoparticles, CO oxidation, Surface oxide.

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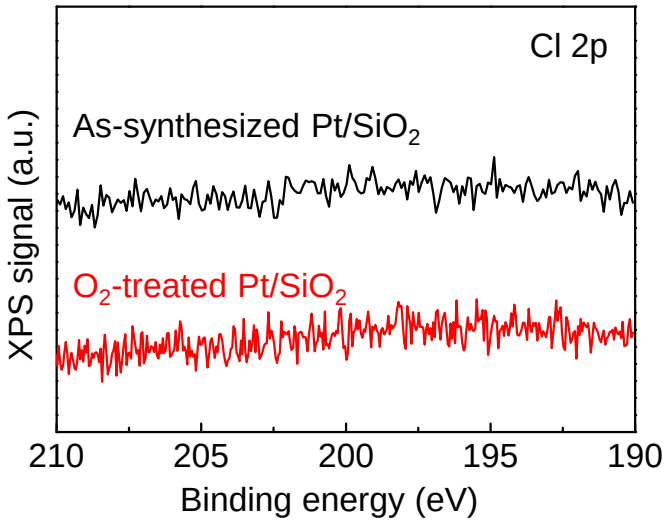

Fig. S1 XPS for Cl 2p for as-synthesized Pt/SiO_2.

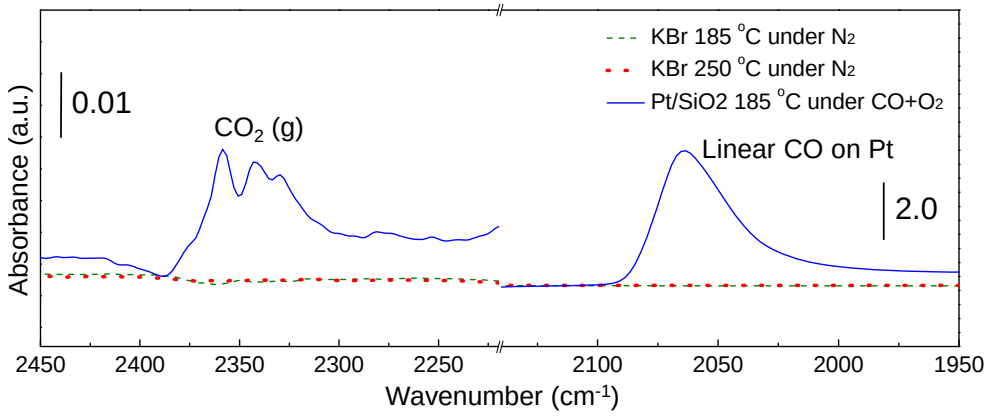

Fig. S2 Comparison of FTIR spectra for KBr under N_2 (185 °C and 250 °C) and Pt/SiO_2 during CO oxidation at 185 °C.

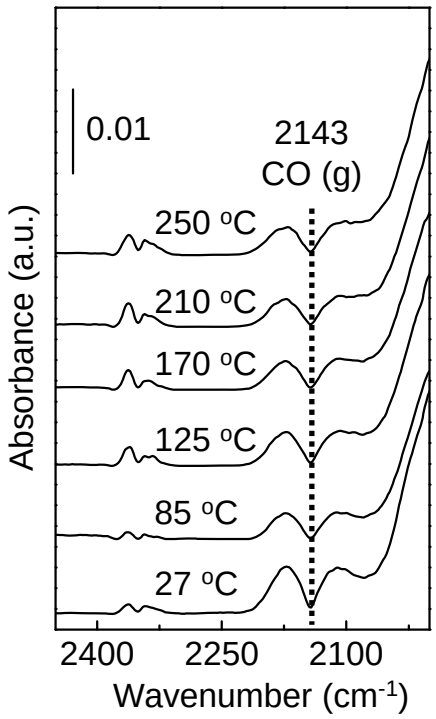

Fig. S3 Temperature-dependent FTIR spectra under CO oxidation condition for bare SiO_2

Peak Designation	Temperature (°C)	Peak Position (cm^{-1})	Peak FWHM (cm^{-1})	Peak Shape
As-synthesized Pt{111}	27	2065	28.1	Gaussian
As-synthesized Pt{111}	151	2056	28.1	Gaussian
As-synthesized Pt{111}	185	2064	27.6	Gaussian
As-synthesized Pt{200}	27	2043	37.3	Gaussian
As-synthesized Pt{200}	185	2039	32.3	Gaussian
O_2-treated Pt{111}	27	2078	24.4	Gaussian
O_2-treated Pt{111}	231	2071	22.8	Gaussian

Table S1. Peak fitting parameters used in quantitative IR analysis.

Relative Co-adsorption	Frequency (cm^{-1})	Pt-C (Å)	C≡O (Å)
1/9 R_F CO	2048	1.867	1.151
2/9 R_F CO	2038	1.858	1.162
3/9 R_F CO	2033	1.855	1.163
2/9 R_F CO + 1/9 R_F O	2047	1.860	1.160
1/9 R_F CO + 2/9 R_F O	2060	1.865	1.158

Table S2 The theoretical calculations of frequencies of CO, Pt–C and C≡O bond lengths as a function of relative Co-adsorption.