

## Supporting Information

### Improved low-temperature catalytic oxidation performance of Pt-based catalysts by modulating electronic and size effect

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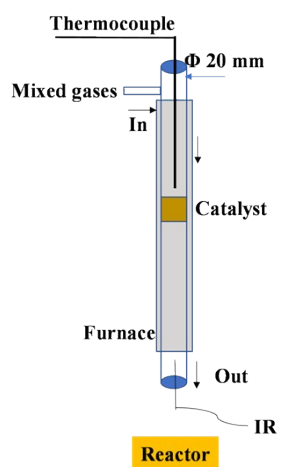
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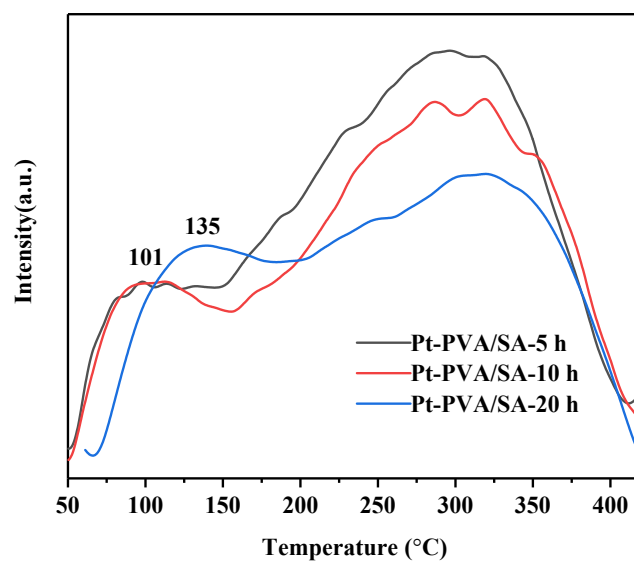
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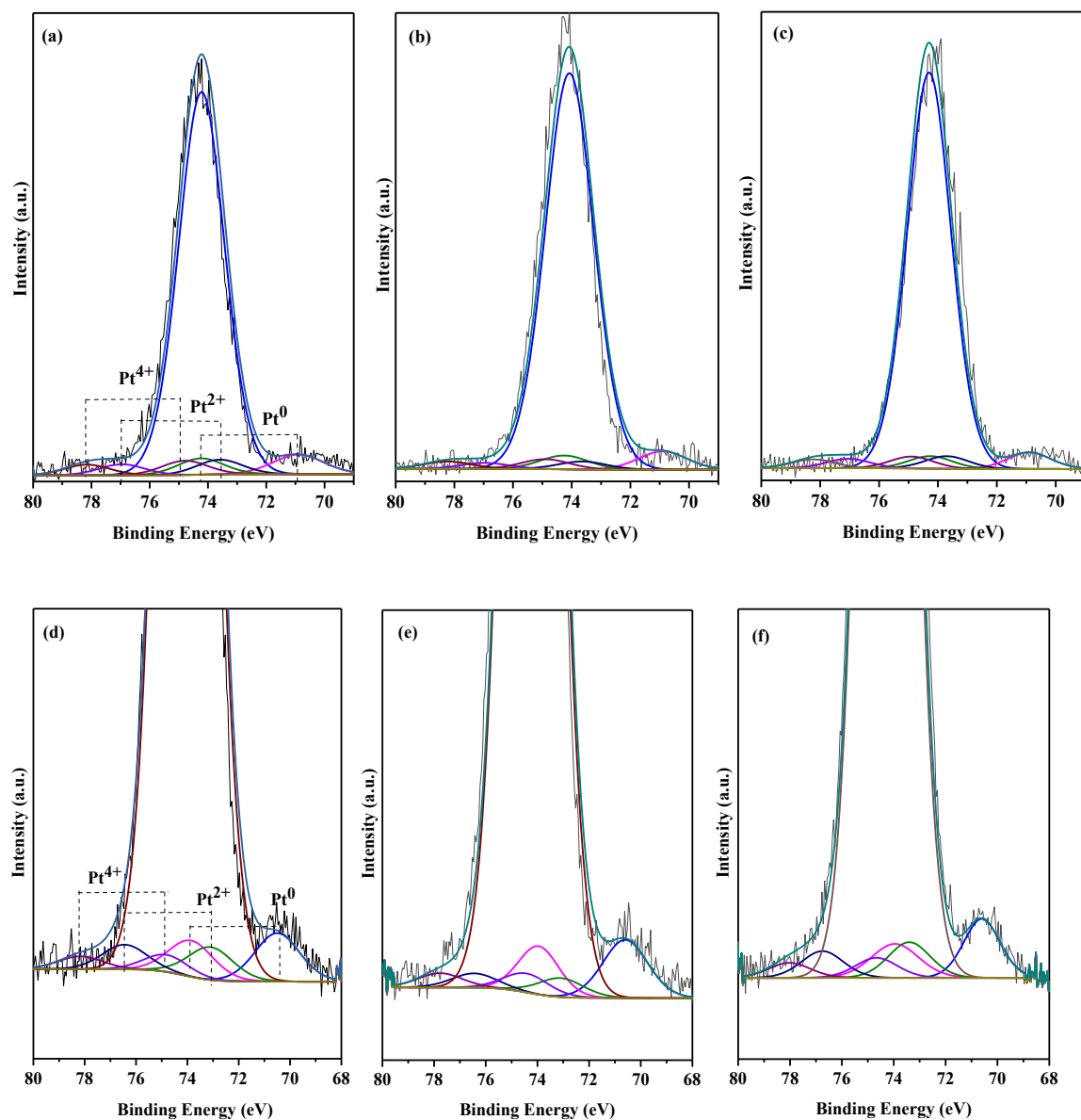
**Table S1** The dispersion and average grain size of different samples.



**Fig. S1.** Schematic diagram of Reactor.



**Fig. S2.** H<sub>2</sub>-TPR curves of catalysts



**Fig. S3** XPS curves of calcinated and degreened catalysts: (a, d) Pt-PVA/SA-5h, (b,e) Pt-PVA/SA-10h, and (c, f) Pt-PVA/SA-20h.

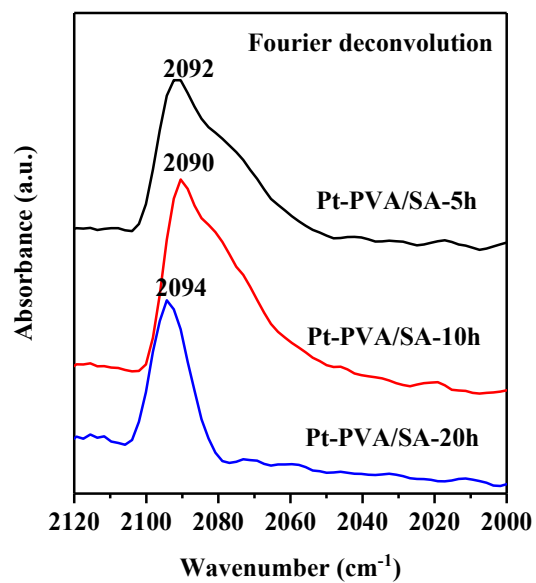


Fig. S4 Fourier deconvolution on CO-FTIR patterns of reduced catalysts

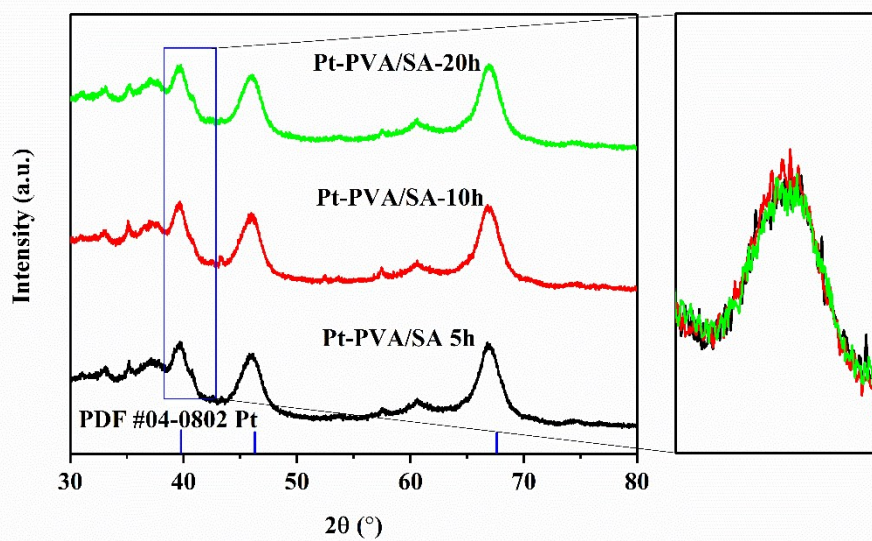
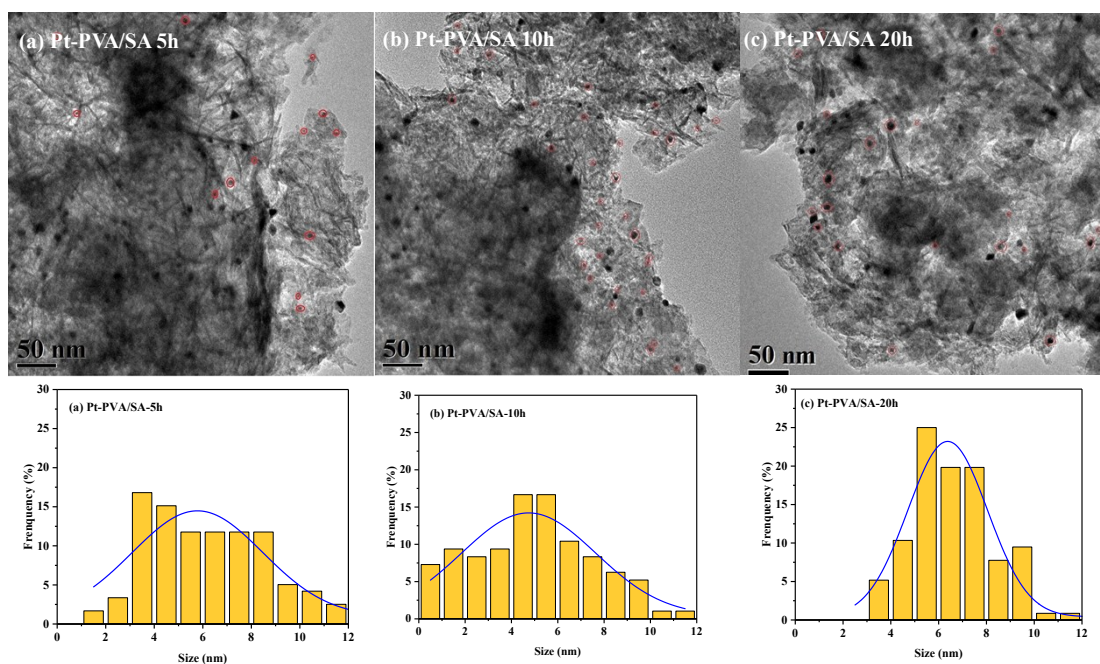
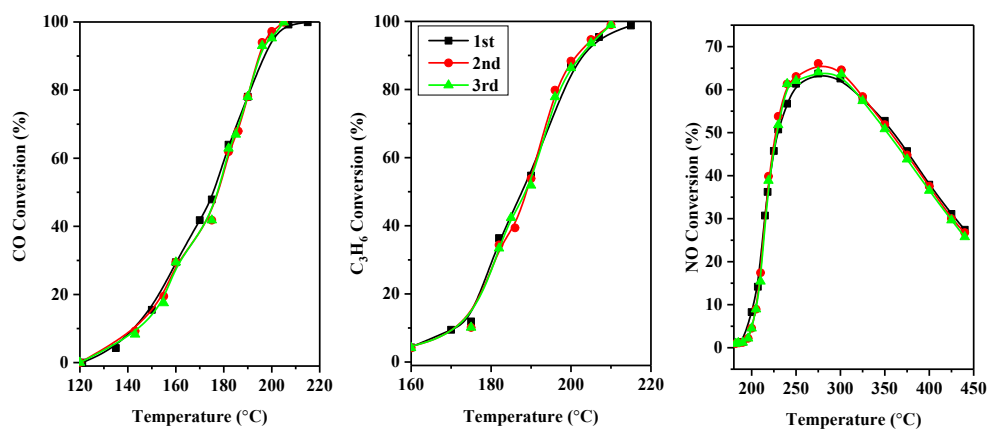


Fig. S5 XRD patterns of catalysts



**Fig. S6** (above) TEM patterns of catalysts and partial platinum particles recorded by red circle and (below) distribution of platinum particles after counting around 100 particles and fitting by gauss.



**Fig. S7.** The repeatable test of the catalytic performance on Pt-PVA/SA-10 h.

**Table S1** The dispersion and average grain size of different samples.

Sample	Dispersion (%)		Average grain size (nm)	
	Quantified from	Derived	Derived from	Statistic

	CO chemisorption	from TEM <sup>a</sup>	CO chemisorption <sup>b</sup>	from TEM
Pt-PVA/SA-5h	21.1	16.2	5.2	6.4
Pt-PVA/SA - 10h	26.0	19.1	4.2	4.9
Pt-PVA/SA-20h	15.4	18.1	7.1	6.6

<sup>a</sup>: TEM dispersion was estimated from particle size distributions.

<sup>b</sup>: Average grain size from CO chemisorption results ( $1.1/D$ ).