

Supporting information

Effects of crystal structure of TiO₂ on the Pd-based catalysts

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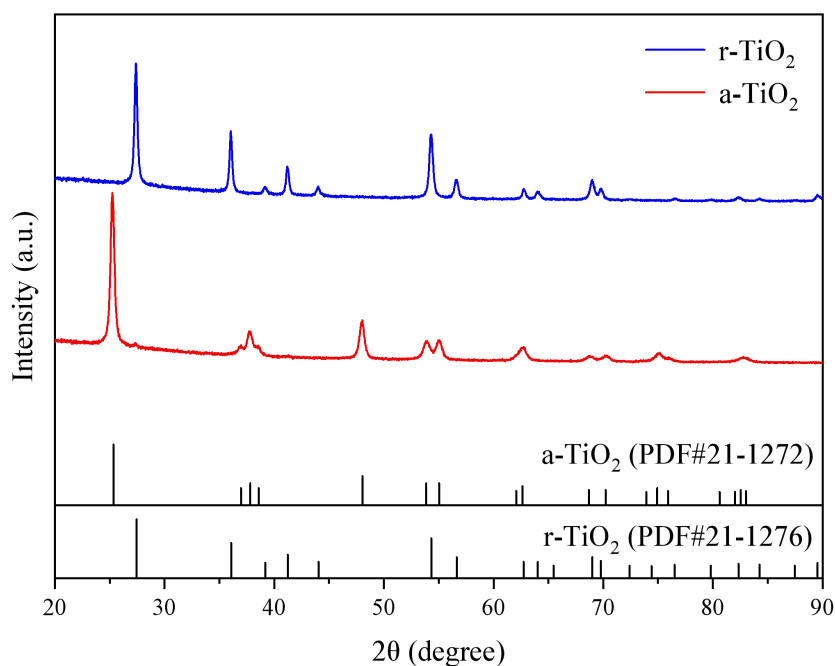


Fig. S1 The XRD patterns for the a-TiO₂ support and r-TiO₂ support.

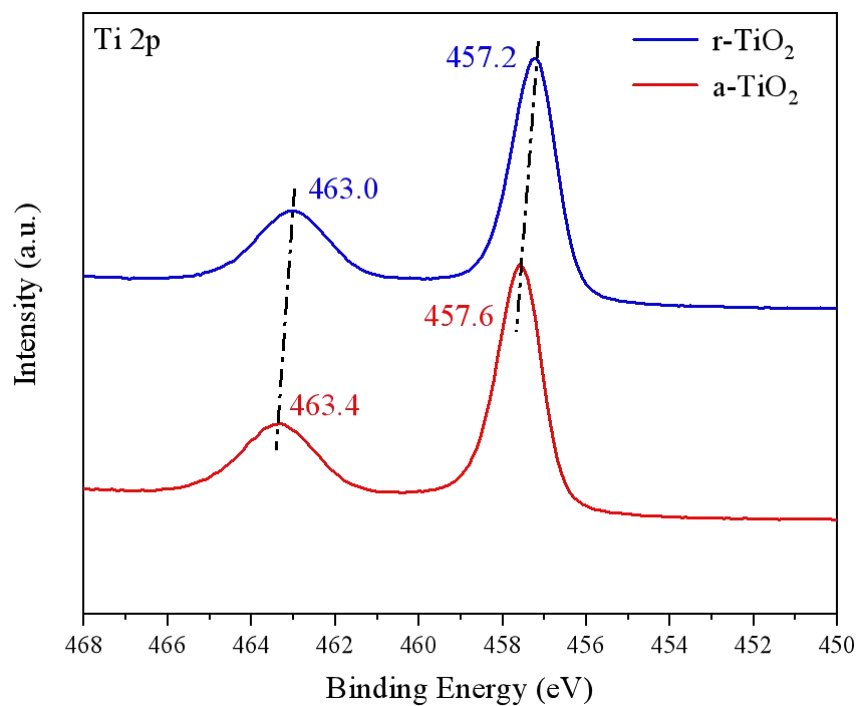


Fig. S2 XPS spectra of Ti 2p for the used Pd/r-TiO₂ catalyst and Pd/a-TiO₂ catalyst.

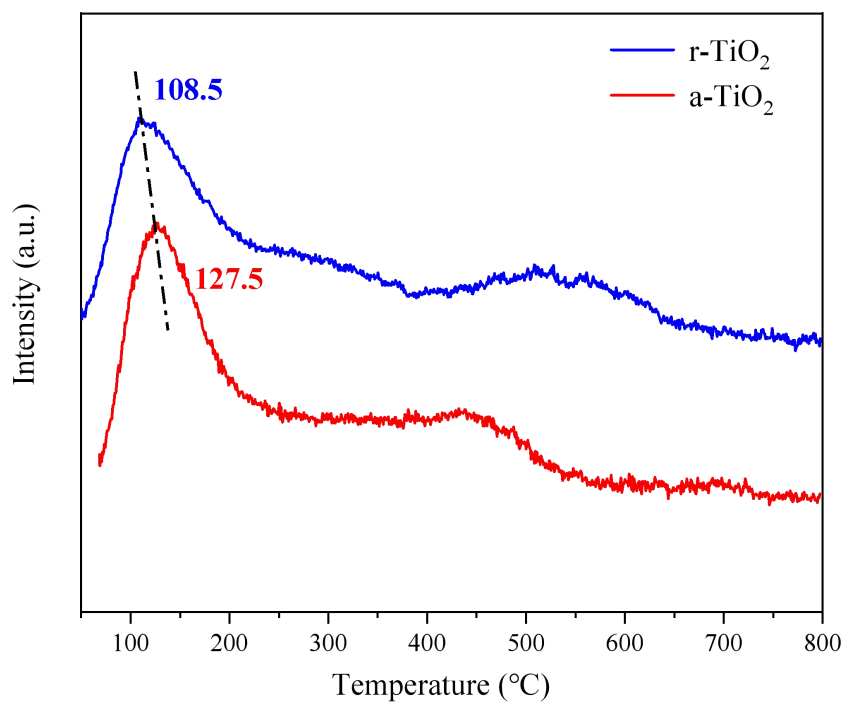


Fig. S3 H₂-TPD profiles for the used Pd/r-TiO₂ catalyst and Pd/a-TiO₂ catalyst.

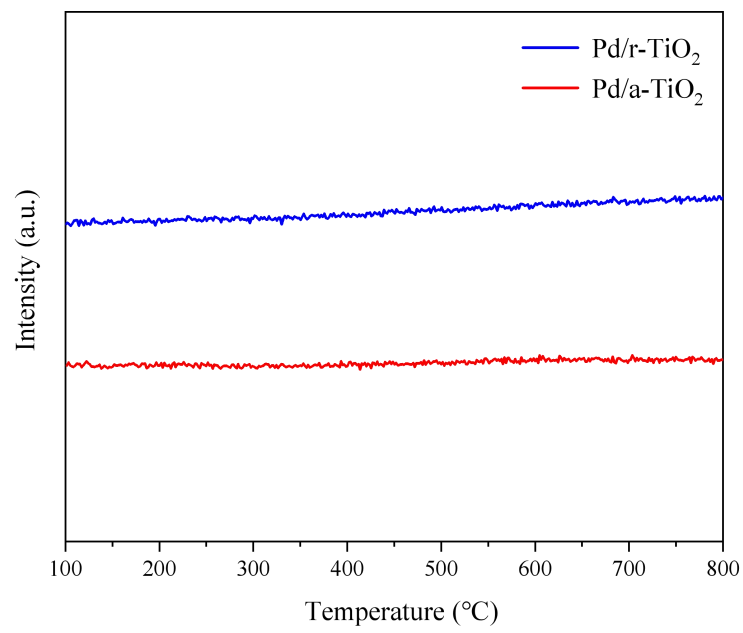
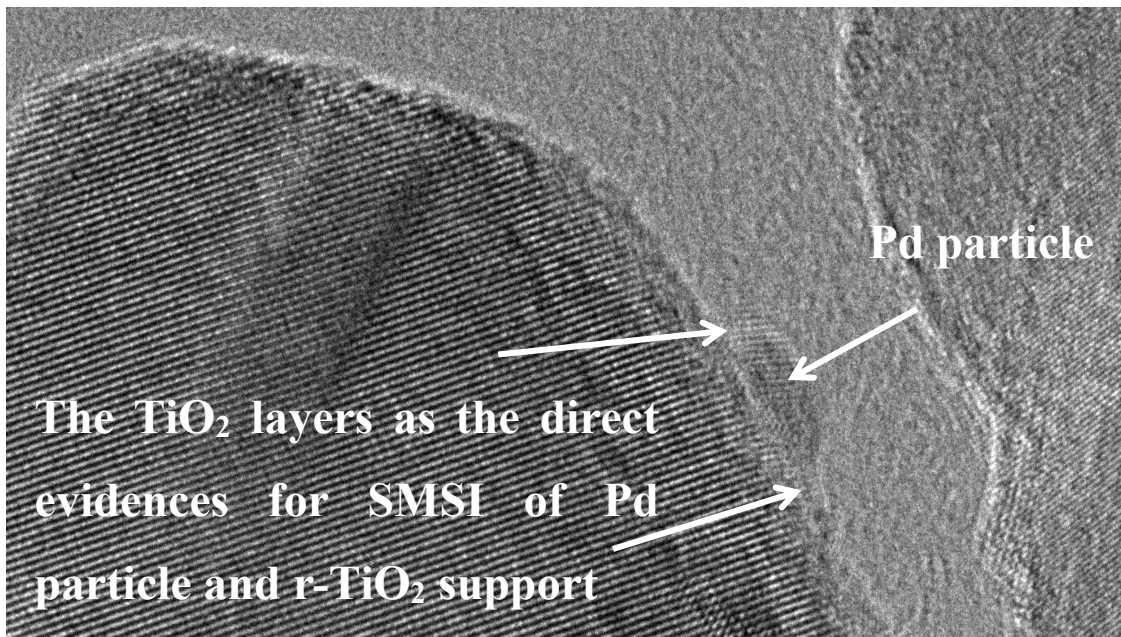
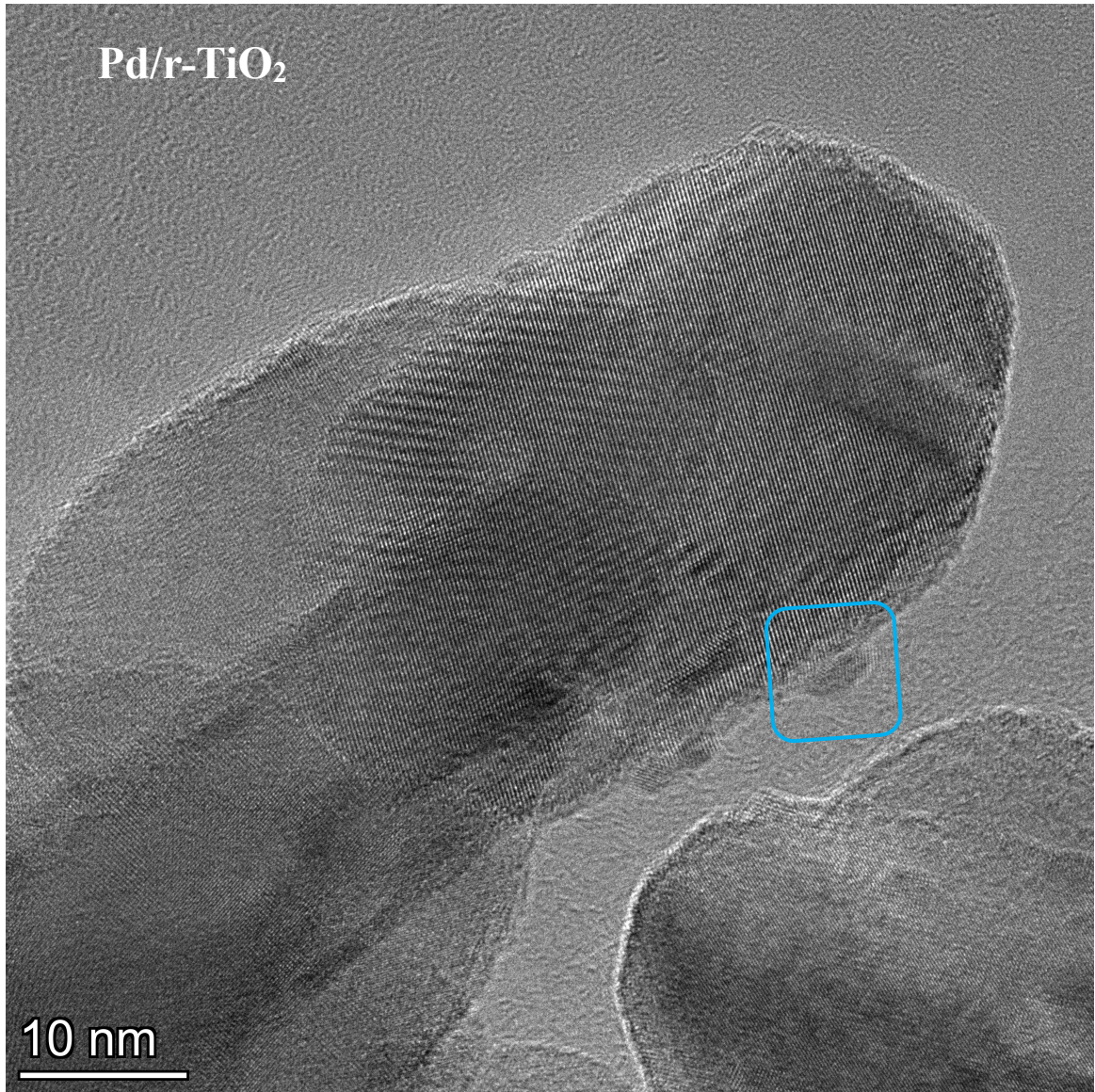


Fig. S4 Blank experiments of TPD for the Pd/r-TiO₂ and Pd/a-TiO₂.



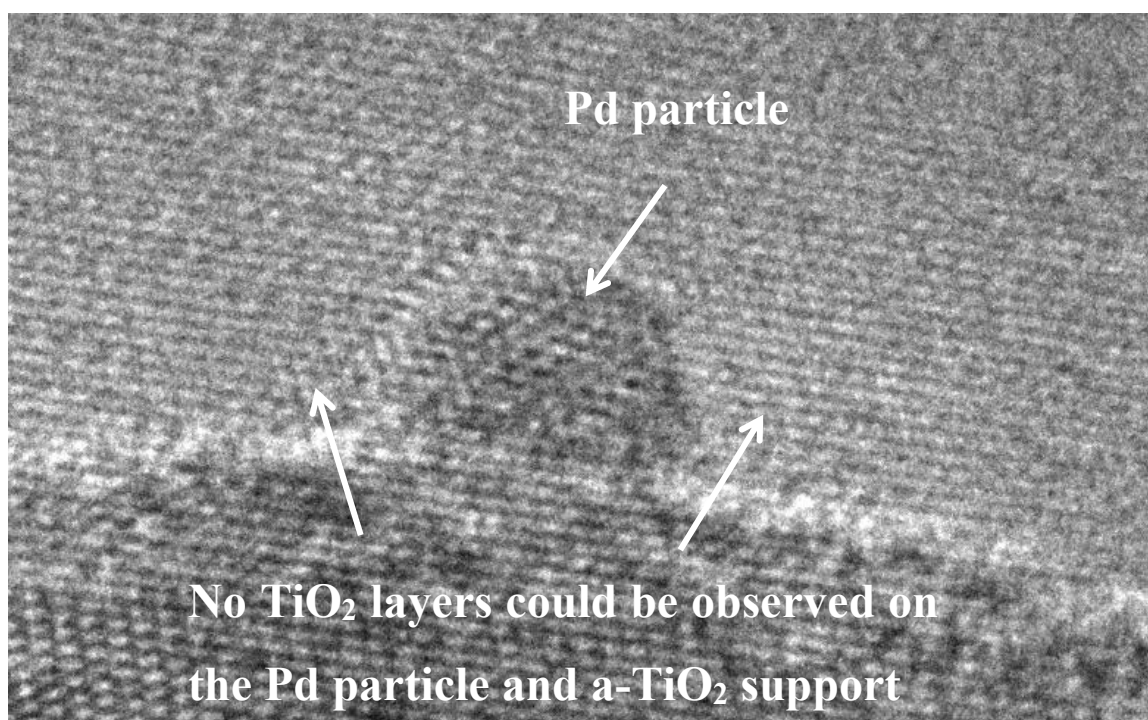
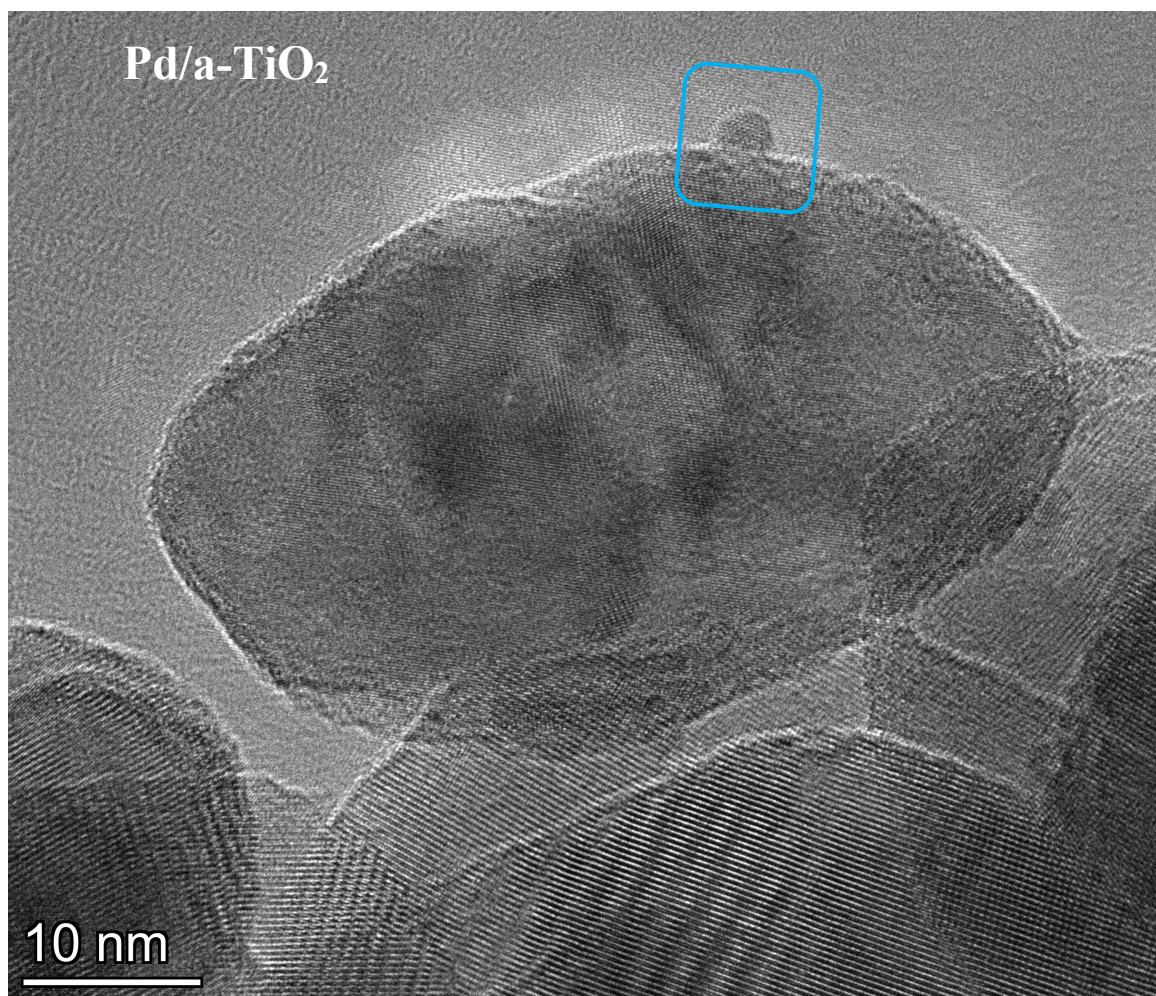


Fig. S5 HR-TEM for the used Pd/r-TiO₂ catalyst and Pd/a-TiO₂ catalyst.

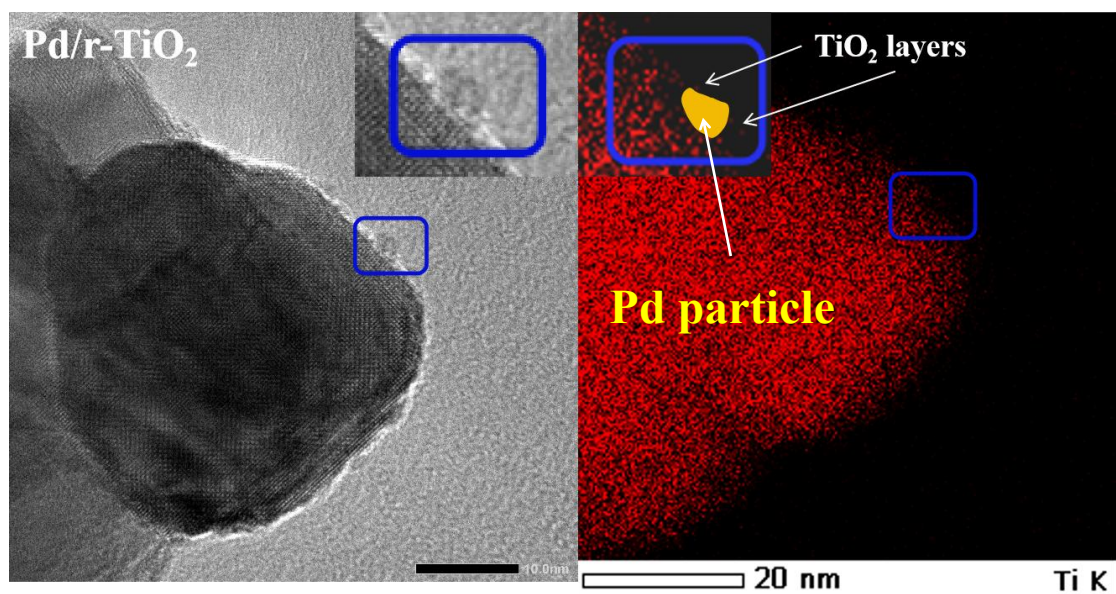


Fig. S6 TEM/EDX elemental mapping of Ti for the used Pd/r-TiO₂ catalyst.

Table S1. Structural parameters of TiO₂ and various Pd-based catalysts

Catalysts	Surface area	Pore volume
	(m ² /g)	(cm ³ /g)
r-TiO ₂	42.9	0.21
a-TiO ₂	54.5	0.27
Pd/r-TiO ₂	35.6	0.18
Pd/a-TiO ₂	45.2	0.28

Table S2. The results of XPS for Pd 3d_{5/2}.

Catalysts	Binding energy (eV)		Surface content of Pd		Pd ²⁺ /Pd ⁰
	Pd 3d _{5/2}		species (atom%) Pd 3d _{5/2}		
	Pd ²⁺	Pd ⁰	Pd ²⁺	Pd ⁰	
Pd/r-TiO ₂	336.5	335.2	80.96	19.04	4.3
Pd/a-TiO ₂	336.2	334.9	72.98	27.02	2.7