

Supplementary Material for

Nanostructured platinum in ordered mesoporous silica as novel efficient catalyst for propane total oxidation

Yidan Cao^a, Rui Ran,^{a,} Yusheng Chen,^a Xiaodong Wu^b and Duan Weng^{a,b,*}*

^a State Key Laboratory of New Ceramics and Fine Processing, School of Materials Science and Engineering, Tsinghua University, Beijing 100084, China

^b Key Laboratory of Advanced Materials of Ministry of Education, School of Materials Science and Engineering, Tsinghua University, Beijing 100084, China

*Corresponding author:

Rui Ran: ranr@tsinghua.edu.cn, Duan Weng: duanweng@tsinghua.edu.cn.

Table S1 Characteristic data of synthesized Pt/Al₂O₃ catalysts.

Sample	S _{BET} (m ² g ⁻¹)		Pore volume (cm ³ g ⁻¹)		Dispersion of Pt ^a (%)	d _{Pt} (nm)		valence of Pt ^c	Pt species on surface ^d (%)		
	Support	Pt/support	Support	Pt/support		CO chem. ^a	TEM ^b		Pt ⁰	Pt ²⁺	Pt ⁴⁺
Pt/Al ₂ O ₃	150	143	0.528	0.524	79.1	1.5	1.9	2.36	11.5	56.3	32.2

^a Dispersion of platinum and d_{Pt} were calculated from CO chemisorption; ^b d_{Pt} was calculated from TEM analysis; ^c Valence of Pt was calculated from H₂-titration; ^d Ratios of Pt species were obtained from XPS analysis.

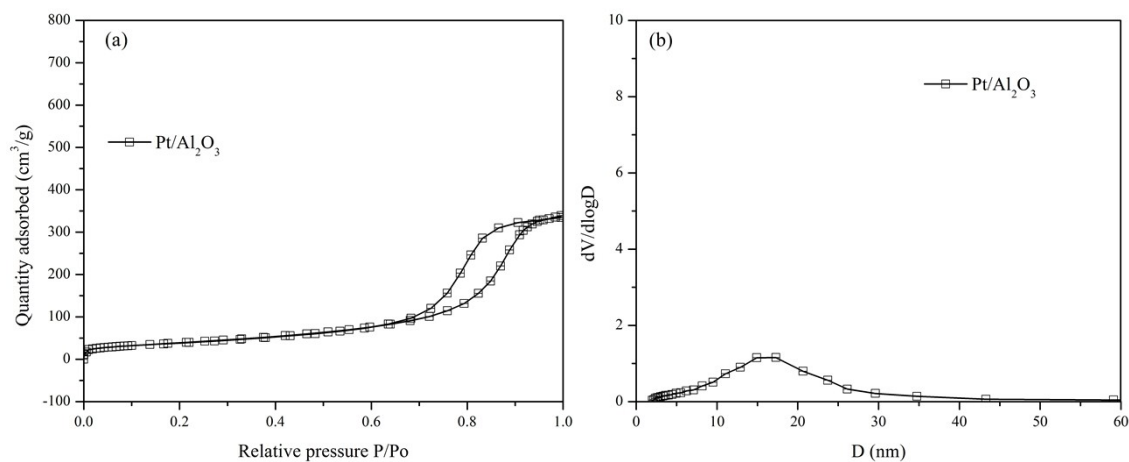


Fig.S1 (a) N₂ adsorption/desorption isotherms and (b) pore size distribution of Pt/Al₂O₃ catalysts.

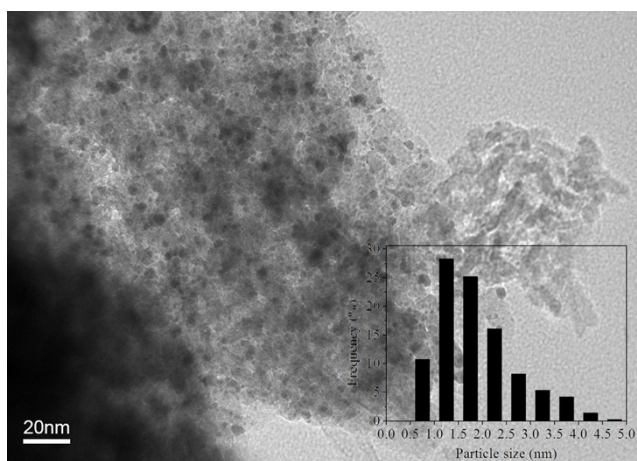


Fig. S2 TEM image of Pt/Al₂O₃ catalyst. The particle size obtained from TEM image was included in Table S1.

Table S2 T_{50} of propane conversion on the catalysts

Samples	T_{50} of propane conversion ($^{\circ}$ C)		
	1 st round	2 nd round	3 rd round
Pt/Al ₂ O ₃	351	331	338
Pt/SBA-15	334	317	320
Pt/KIT-6	266	245	249