

Supporting Information

Thermally stable Pd/CeO₂@SiO₂ with core-shell structure for catalytic lean methane combustion

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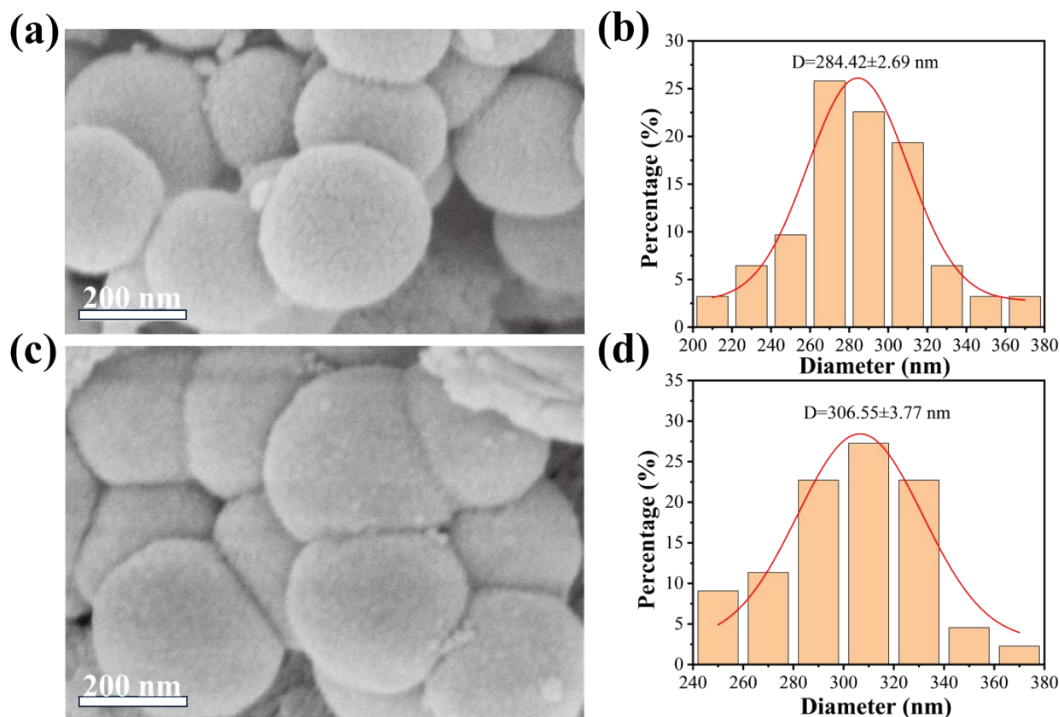


Fig. S1. (a) SEM images of Pd/CeO₂, (b) the size distribution of Pd/CeO₂, (c) SEM images of Pd/CeO₂-spent, and (d) the size distribution of Pd/CeO₂-spent.

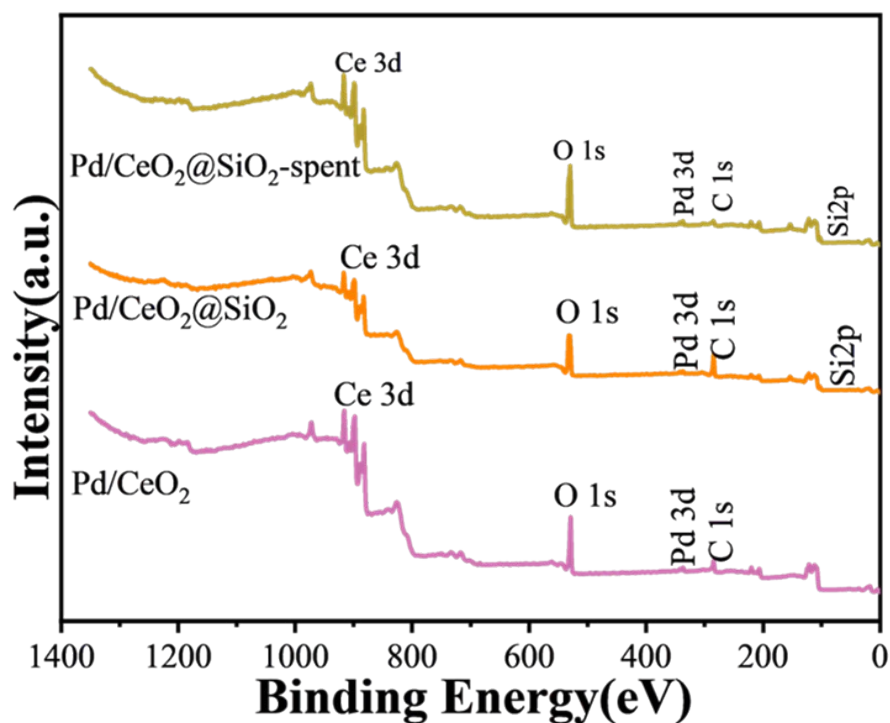


Fig. S2. The full spectrum of the as-prepared catalysts.

Table S1. Comparison of catalytic CH₄ combustion performance of Pd-based catalysts

Catalysts	Pd (wt.%)	T ₉₀	Catalytic conditions	Space velocity (mL/g·h)	References
Pd/CeO ₂ @SiO ₂	0.99	405	1 vol% CH ₄ , 10 vol% O ₂ in N ₂ balance	30000	This work
Pd/CO ₃ O ₄	1	467	1 vol% CH ₄ , O ₂ (excess), N ₂ (balance)	60000	S1
PdO/CeO ₂ @HZSM-5	0.93	535	0.5 vol% CH ₄ , 10 vol% O ₂ /Ar	30000	S2
NiO@PdO/Al ₂ O ₃	0.2	368	1 vol% CH ₄ balanced with air	30000	S3

Pd/CeO ₂	1	445	1 vol% CH ₄ , 20 vol% O ₂ , N ₂ (balance)	16,000	S4
H-Pd@CeO ₂ -600(24)	1	465	2 vol% CH ₄ , 4 vol% O ₂ , and 20 vol% CO ₂ in N ₂ balance	100000	S5
Pd/ κ -CeZrO ₄	0.95	345	1 vol.% CH ₄ , 20 vol.% O ₂ and N ₂ balance	30000	S6
Pd@S-1	0.6	350	1 vol% CH ₄ , 16 vol% O ₂ and balanced with N ₂	50000	S7
Pd@H-ZSM-5	0.7	400	1% CH ₄ and 5% O ₂ (He as balance)	60000	S8
Pd(PdO)/Co ₃ O ₄ @SiO ₂	1	445	1%CH ₄ , 21%O ₂ and balance N ₂	30 000	S9
Pd@CeO ₂ -BDC	1	342	1 vol% CH ₄ , balanced with air	60000	S10

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