

Supporting Information (SI)

The Effect P Additive on the CeZrAl Support Properties and the Activity of the Pd Catalysts in Propane Oxidation

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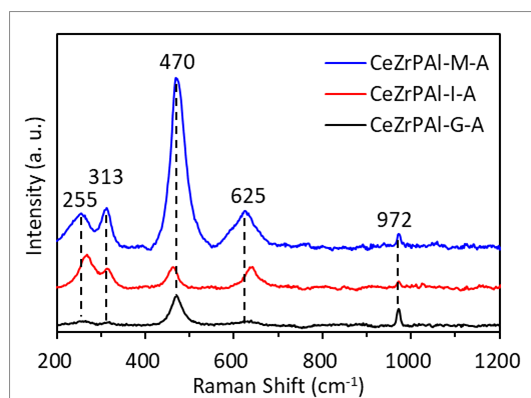


Figure S1. Raman spectra of the aged CeZrPAI composite oxides prepared by different methods.

Table S1 The P content on the surface of the support prepared by different methods (results presented in weight percentage), mapping data based on the EDS.

Samples	P content (wt%)	
	F	A
CeZrPAI-G	1.62	1.31
CeZrPAI-I	1.39	1.24
CeZrPAI-M	1.42	1.29

Table S2 The data of OSC of supports prepared by different methods based on normalized surface area data.

Samples	OSC/SA (mmol/m ²)	
	F	A
CeZrPAI-G	0.91	0.63
CeZrPAI-I	1.41	0.72
CeZrPAI-M	0.83	0.39

Notes: Given as surface area, SA.

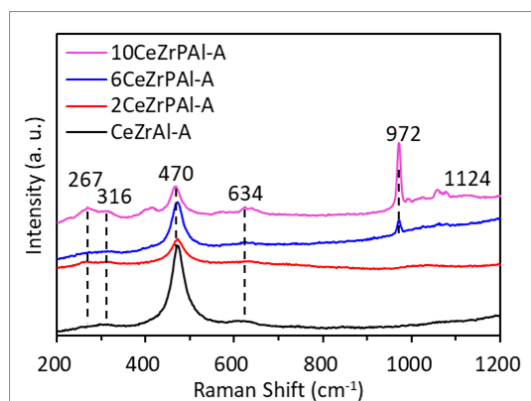


Figure S2. Raman spectra of the aged CeZrPAI composite oxides with different phosphorus contents.

Table S3 The P content on the surface of supports with different P adding (results presented in weight percentage), mapping data based on the EDS.

Samples	P content (wt%)	
	F	A
CeZrAl	0	0
2CeZrPAI	0	0
6CeZrPAI	1.62	1.31
10CeZrPAI	2.72	2.25

Table S4 The data of OSC of supports with different P adding based on normalized surface area data.

Samples	OSC/SA (mmol/m ²)	
	F	A
CeZrAl	1.50	1.44
2CeZrPAI	1.28	1.08
6CeZrPAI	0.89	0.63
10CeZrPAI	0.68	0.79

Notes: Given as surface area, SA.

Table S5 The data on Pd particle size of catalysts loaded on supports with and without P.

Samples	State	Pd particle size (nm)
CeZrAl	F	6.2
6CeZrPAI		4.9
CeZrAl	A	11.8
6CeZrPAI		13.0