

Supplementary information

Table S1 The features of CeO₂ powders before and after ageing at 900 °C

ageing	crystalline structure	S _{BET} / m ² ·g ⁻¹	primary particle size ^a / nm	Ce ³⁺ /Ce ⁴⁺ ^b / %	T ₅₀ / °C
none	fluorite	173	1~3	31	>600
900 °C, 10% H ₂ O/air	fluorite	6	>100	33	>600

^a Determined by TEM images.

^b Determined by Ce3d XPS spectra.

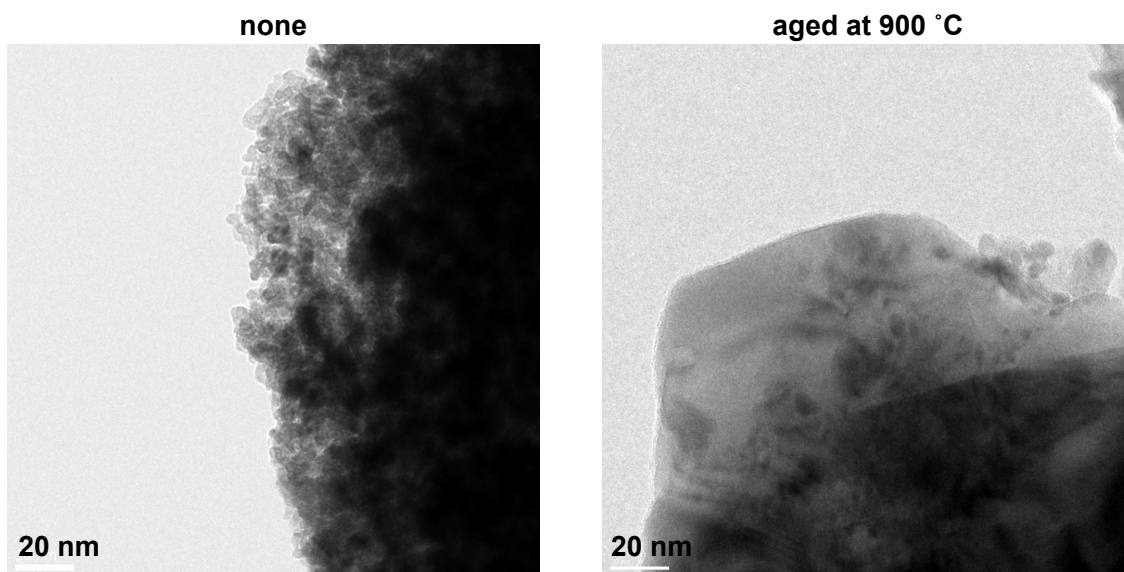


Figure S1 TEM images of CeO₂ powders before and after ageing at 900 °C.

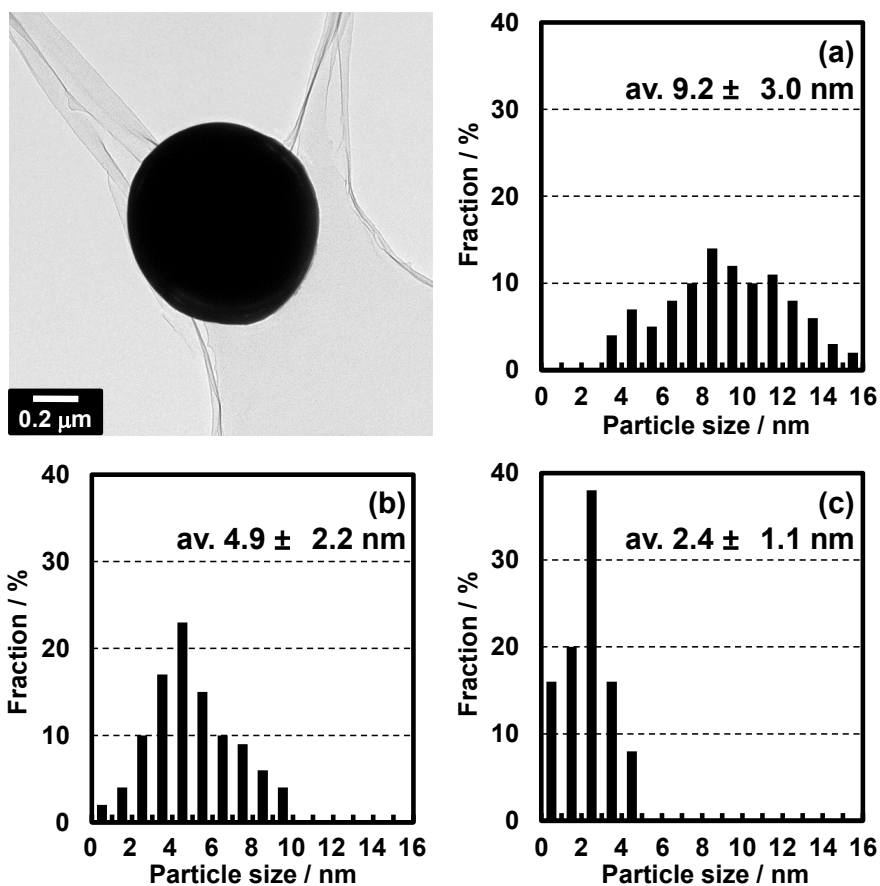


Figure S2 Size distributions and average sizes of Rh metal nanoparticles prepared by using arc-plasma process with input energies of (a) 29 J, (b) 6 J and (c) 3 J.

The size of metal nanoparticles increased with an increase of input energy. As shown in TEM image, large metal droplets were also deposited at the highest input energy (29 J).

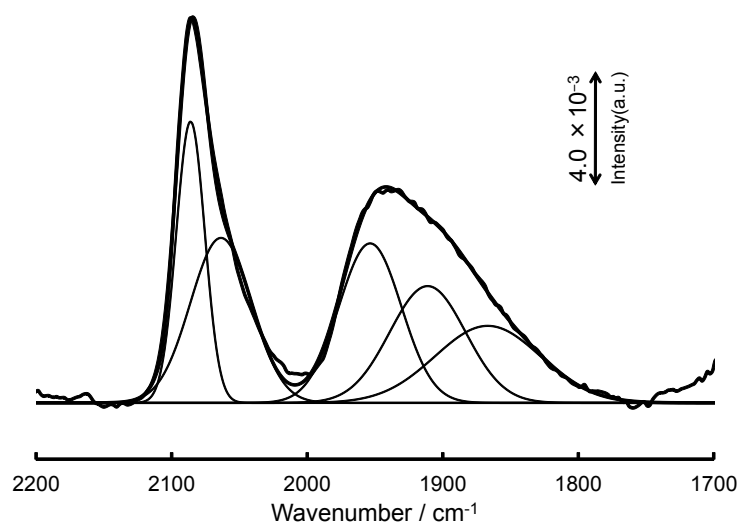


Figure S3 in situ FT-IR of CO adsorbed on Pd/CeO₂ (AP1) at 50 °C.

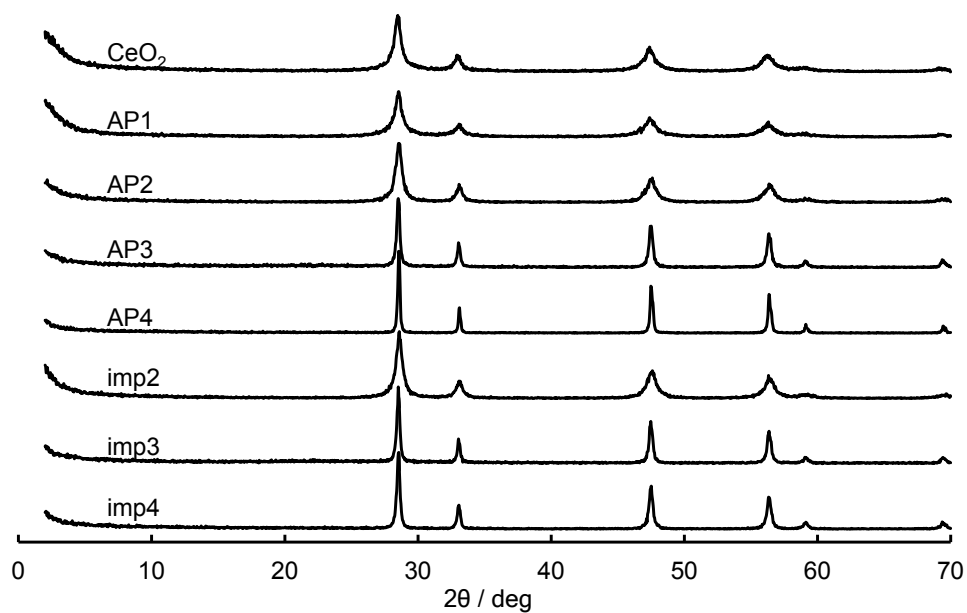


Figure S4 XRD patterns of CeO₂ and Pd/CeO₂(AP1~AP4 and imp1~imp3) before and after thermal ageing.

