Supplementary Material (ESI) for Journal of Materials Chemistry

Mesoporous PdCo sponge-like nanostructure synthesized by electrodeposition and dealloying for oxygen reduction reaction

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Electronic supplementary information

A. Additional analyses on the UV-vis spectra

As for the UV-vis spectra shown in Fig. 1a, the absorbance was increased toward the smaller wavelength. This is probably not due to the absroption by the complexes. Generally, such baseline shift is attributed to scattering such as Rayleigh scattering and Mie scattering. The complexes should be smaller than the wavelength of the measurements, we assumed Rayleigh scattering and analyzed as shown in Fig. S1. We reasonablly conclude that the significant baseline shift was attributed to Rayleigh scattering.

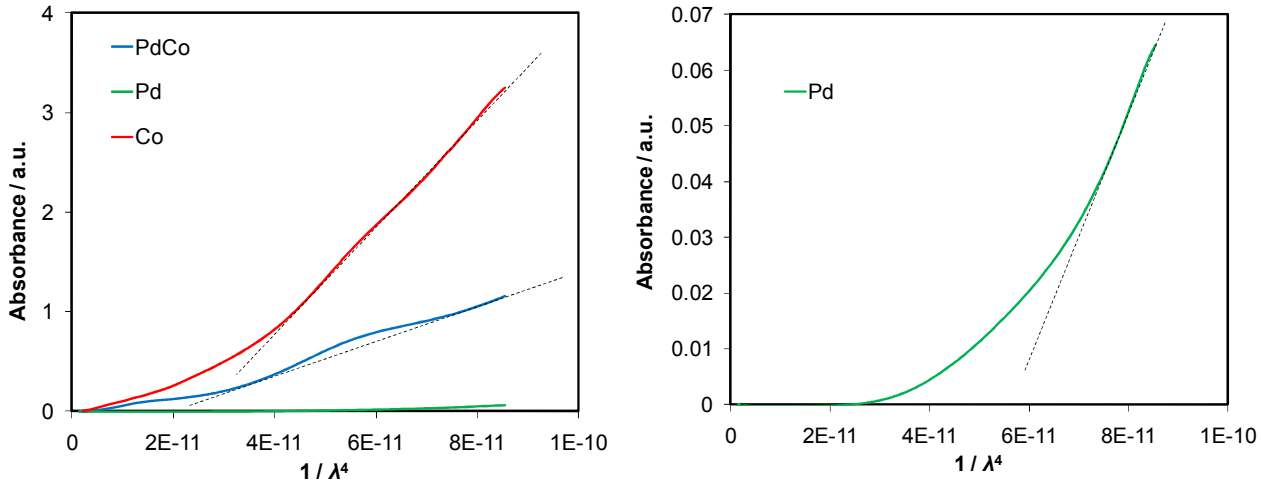

Fig. S1 Relation between the absorbance and λ^{-4} (λ, the wavelength) of the UV-vis spectra shown in Fig. 1a.

B. TEM images of the mesoporous dendrites (a coral-reef-like PdCo nanostructure)

The preparation procedure was reported in the previous report.[1] The mesoporous structure was observed by TEM and the selected area electron diffraction pattern shows a single-crystal-like spots. This is confirmed by the lattice fringes which were observed to be oriented over the mesopores.

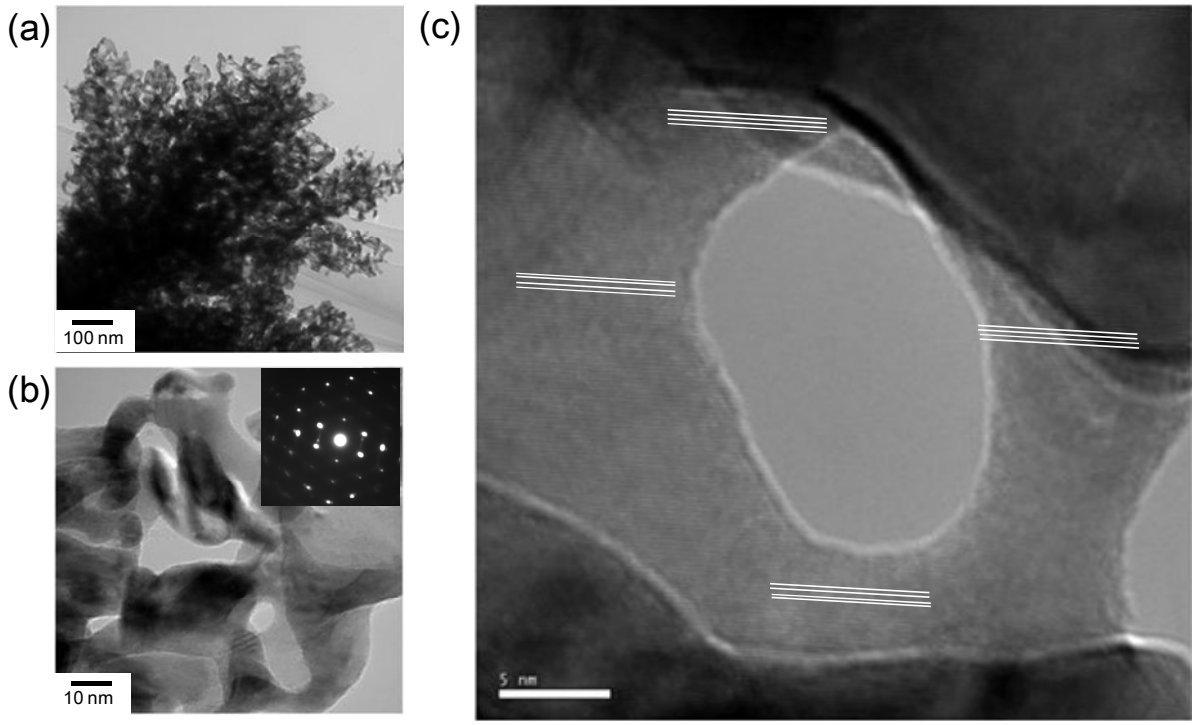

Fig. S2 TEM images of the mesoporous PdCo dendrites synthesized by the combination of electrodeposition and dealloying. The inset in the figure b is a selected area electron diffraction pattern. The parallel lines in the figure c show the direction of lattice fringes.

C. Cyclic voltammogram of an electrodeposited Pd

The preparation procedure was reported in the previous report.[2]

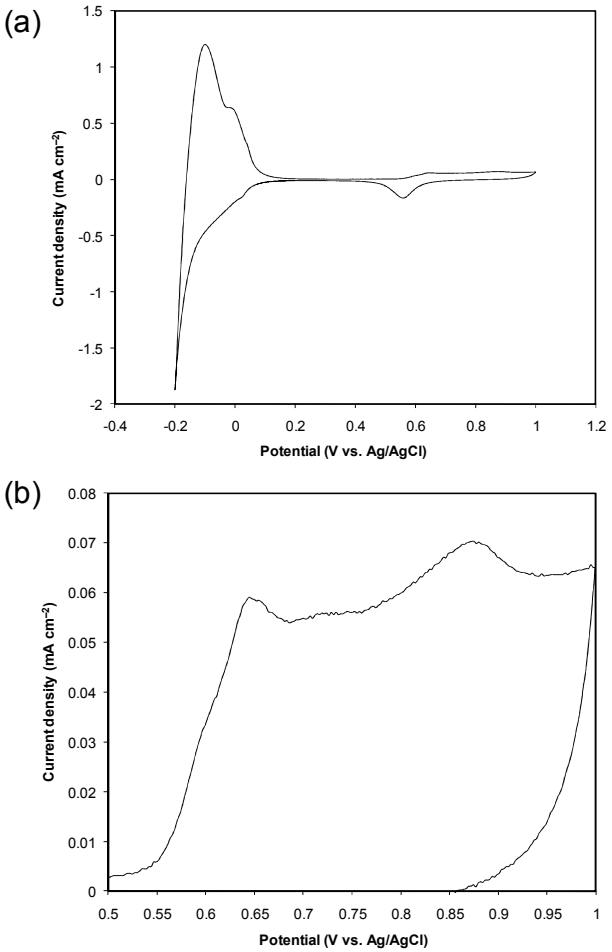

Fig. S3 Cyclic voltammogram of an electrodeposited Pd in a nitrogen-saturated 0.5 M H_2SO_4 solution at 50 mV s^{-1}.

References

1. S. Tominaka, Y. Nakamura and T. Osaka, *J. Power Sources*, 2010, **195**, 1054-1058.
2. S. Tominaka, T. Momma and T. Osaka, *Electrochim. Acta*, 2008, **53**, 4679-4686.