Electronic Supplementary Information

Ru-assisted synthesis of Pd/Ru nanodendrites with high activity for ethanol electrooxidation

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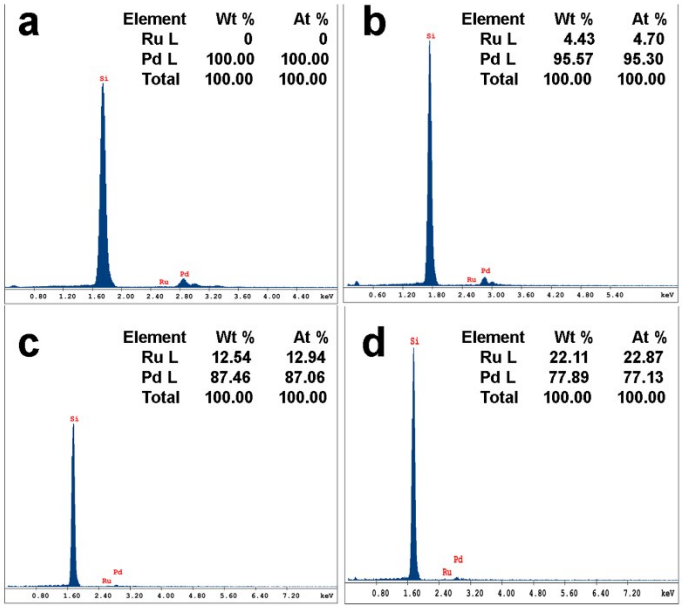

Figure S1 EDS patterns of the Pd (a), Pd_{20}/Ru_1 (b), Pd_7/Ru_1 (c) and Pd_3/Ru_1 (d). Slide glass were used as EDS substrates.

Table S1 Summary of molar ratios for catalysts based on EDS and ICP analysis		
Catalysts	Molar ratio by EDS (Pd/Ru)	Molar ratio by ICP (Pd/Ru)
Pd_{20}/Ru_1	20.28/1	22.20/1
Pd_7/Ru_1	6.73/1	6.76/1
Pd_3/Ru_1	3.37/1	3.91/1

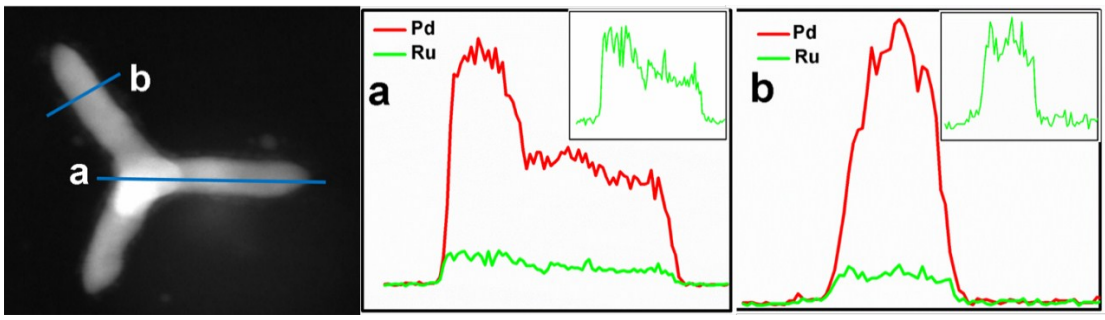

Figure S2 EDX line scan profile of Pd_7/Ru_1 nanocomposite.

From the line-scanning profile across the particle, the intensity of the Pd-L line is somewhat stronger than that of the Ru-L line, but they are similar in shape, indicating a uniform distribution of both Pd and Ru atoms within the alloy nanoparticles.

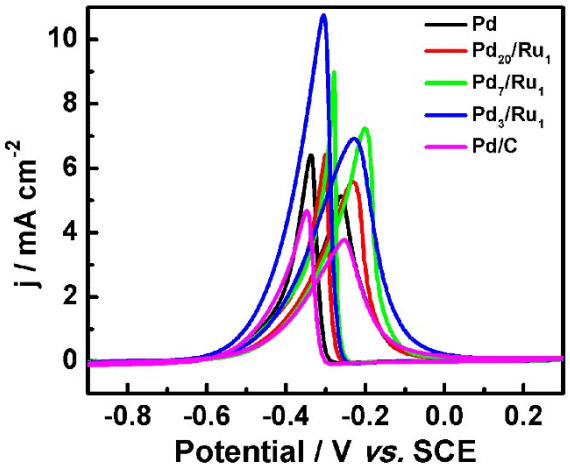

Figure S3 CVs of Pd, Pd_{20}/Ru_1, Pd_7/Ru_1, Pd_3/Ru_1 and Pd/C catalysts in 1.0 M CH_3CH_2OH + 1.0 M KOH at a scan rate of 50 mV s^{-1}.

Figure S3 shows the CVs of ethanol oxidation on Pd, Pd_{20}/Ru_1, Pd_7/Ru_1, Pd_3/Ru_1 and Pd/C catalysts in 1.0 M CH_3CH_2OH + 1.0 M KOH at a scan rate of 50 mV s^{-1}. The current densities are normalized to the ECSA. As shown in Figure S3, the Pd_7/Ru_1 catalyst exhibits higher current density toward ethanol oxidation than any other catalysts. Besides, all the Pd/Ru catalysts exhibit higher current densities than that of Pd, which are basically consistent with the results of Figure 5 in the manuscript.

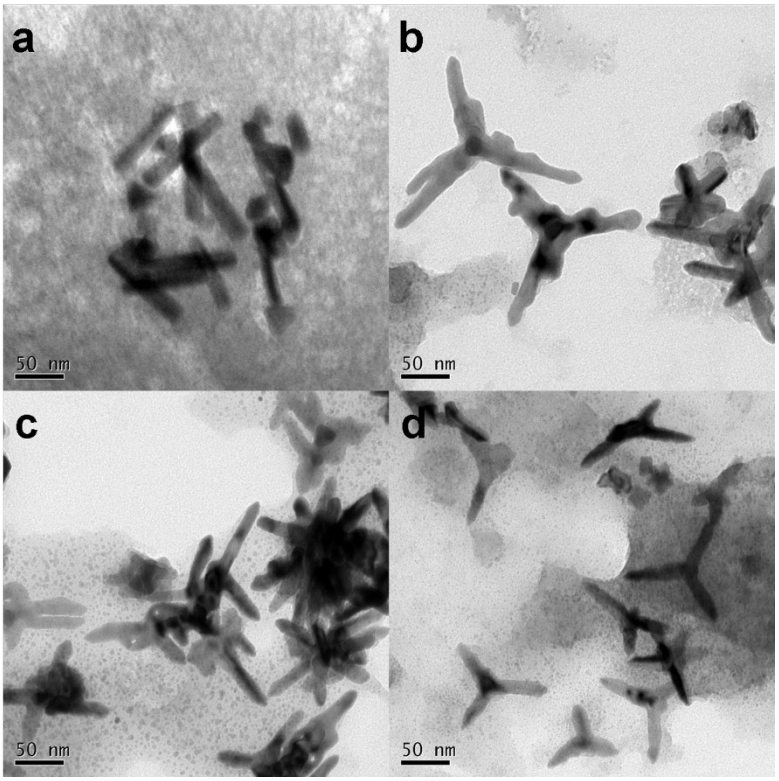

Figure S4 Representative TEM images of Pd (a), Pd_{20}/Ru_1 (b), Pd_7/Ru_1 (c) and Pd_3/Ru_1 (d) after chronoamperometric test of 3600 s.

As shown in Figure S4, it is clearly observed that some Pd nanoparticles aggregate after durability test (Figure S4a). While for Pd/Ru catalyst, the Pd/Ru nanoparticles are still distributed well and almost have no obvious changes after chronoamperometric experiment.