

Table S1. Onset potentials, peak current densities and $j_{\text{f}}/j_{\text{b}}$ ratios of Pd/C and Rh-on-Pd/C catalysts with different Pd/Rh ratios during the CV tests

Nominal composition	E_{onset} (V)	j_{peak} (mA mg ⁻¹)	$j_{\text{f}}/j_{\text{b}}$ ratio
Pd/C	-0.55	102.8	0.7
Rh-on-Pd (7:1)/C	-0.60	55.6	1.2
Rh-on-Pd (5:1)/C	-0.61	40.0	1.4
Rh-on-Pd (3:1)/C	-0.63	39.7	2.2
Rh-on-Pd (1:1)/C	-0.66	30.1	2.7

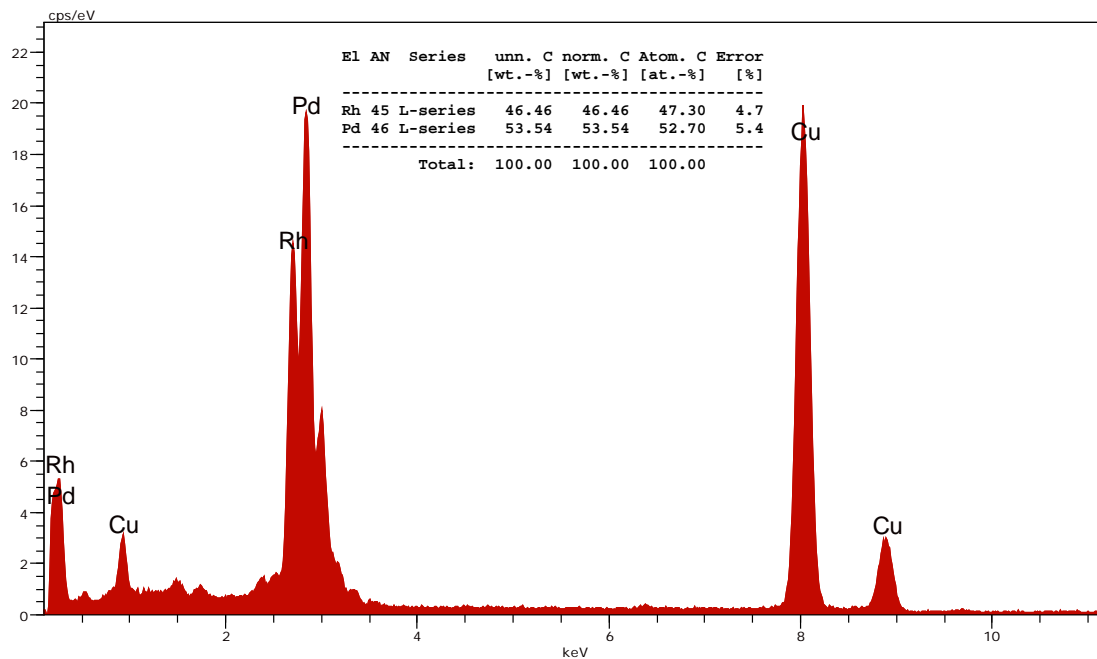


Figure S1 EDS spectrum of Rh-on-Pd (1:1) bimetallic nanodendrites in Fig. 1a

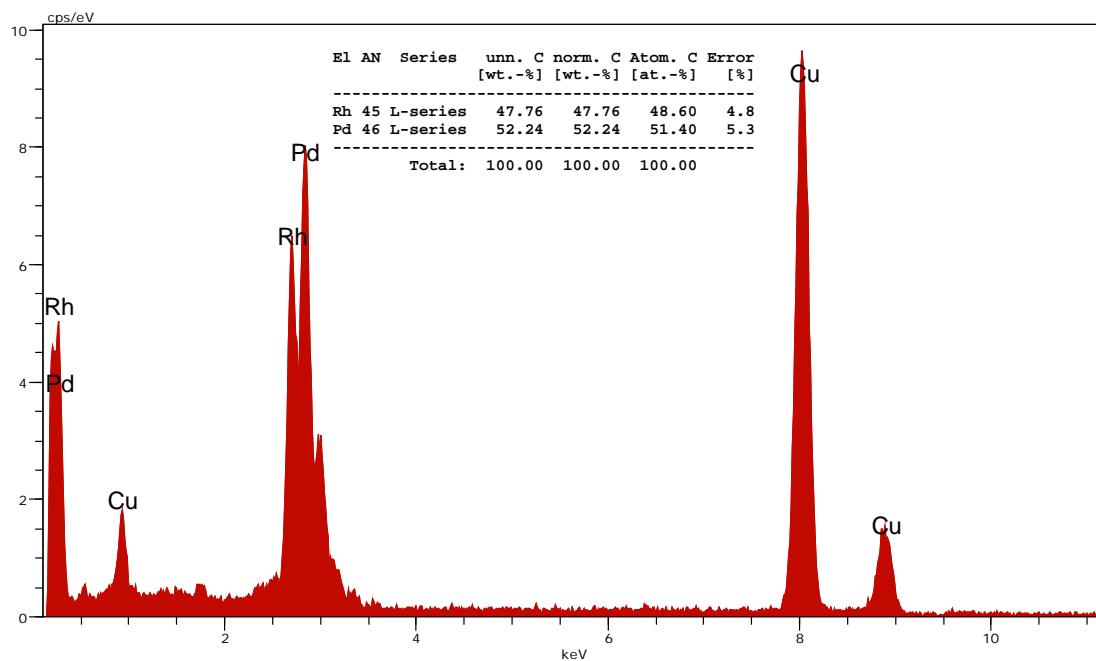


Figure S2 EDS spectrum of a single Rh-on-Pd (1:1) bimetallic nanodendrite in Fig. 1b

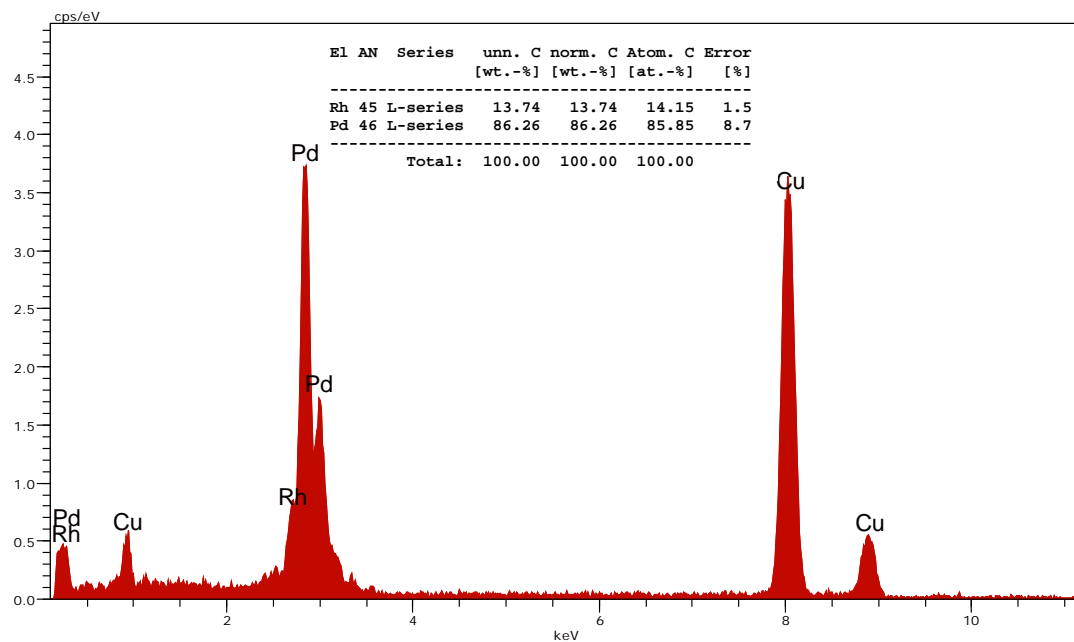


Figure S3 EDS spectrum of the Circle A region in Fig. 1b

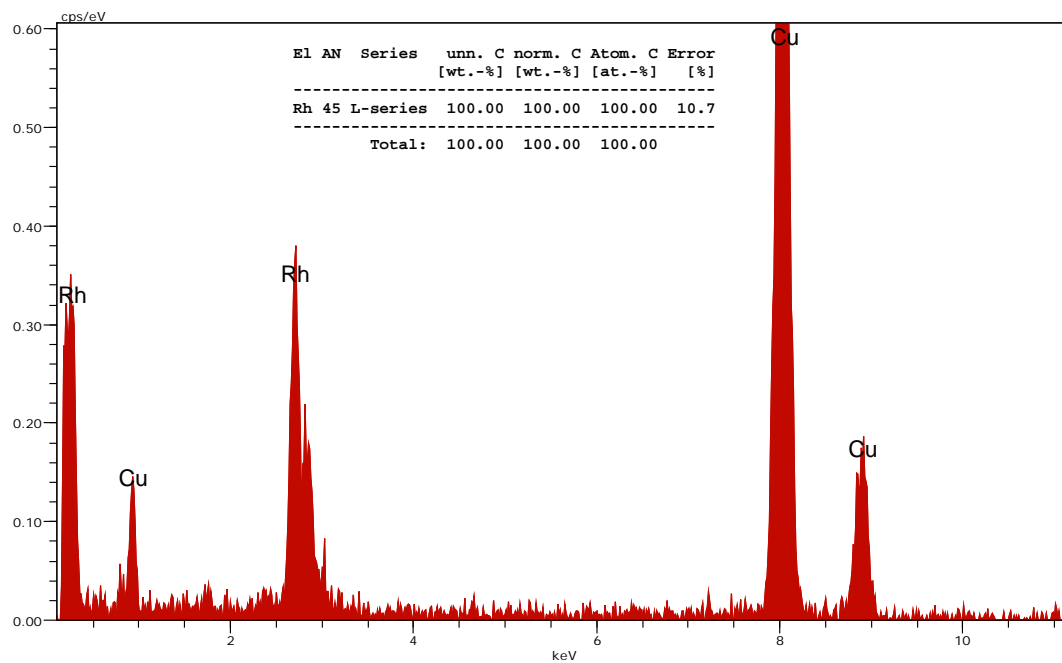


Figure S4 EDS spectrum of the Circle B region in Fig. 1b

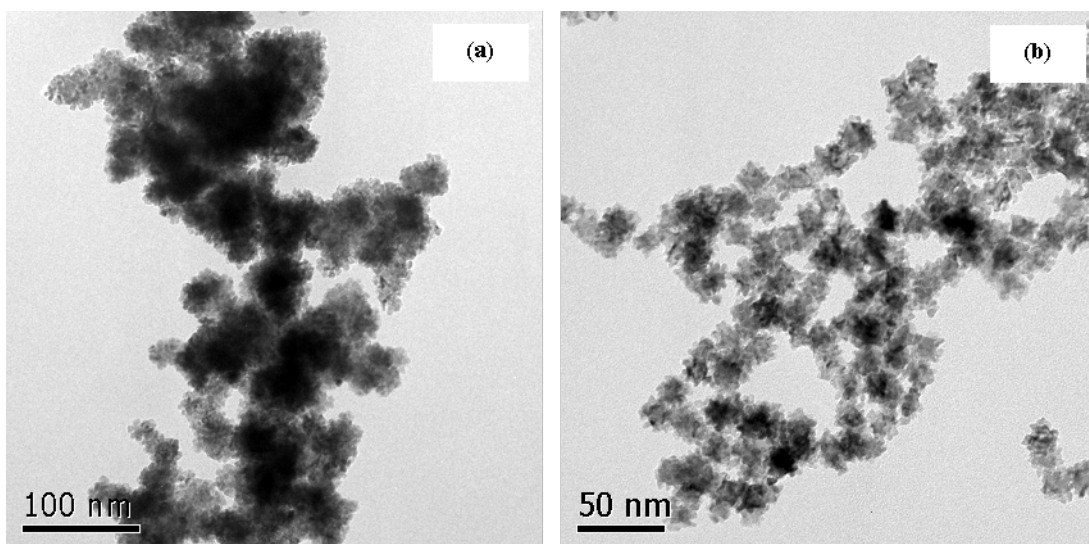


Figure S5 TEM images of Rh-on-Pd (1:1) bimetallic nanodendrites with no structure-directing agent (a) and by replacing CTAB with CTAC (b).

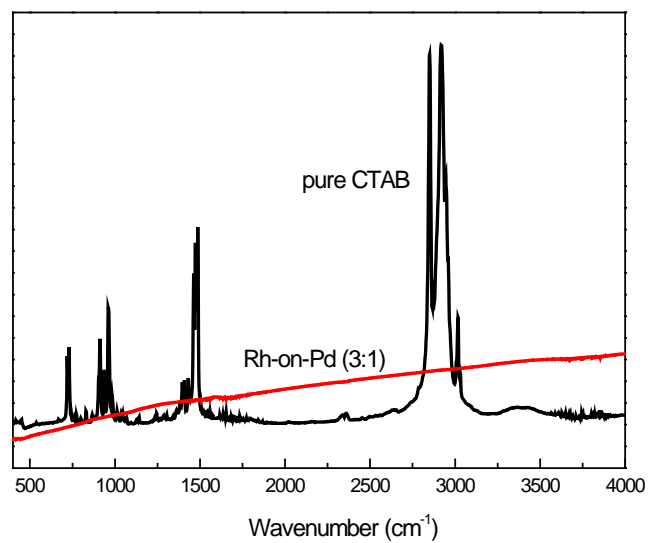


Figure S6 FT-IR spectra of pure CTAB and Rh-on-Pd (3:1) bimetallic nanodendrites after washing

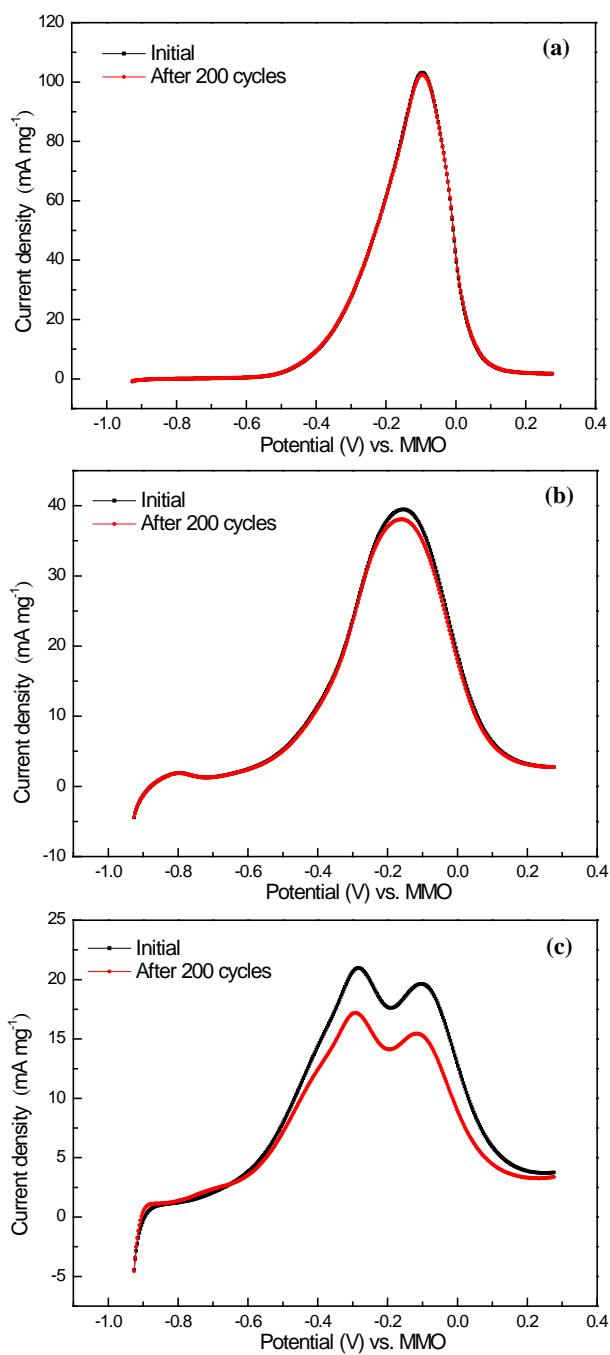


Figure S7 Positive-going CV curves of the EOR on Pd/C (a), Rh-on-Pd (3:1)/C (b) and Rh/C (c) catalysts before and after 200 cycles. (1.0 M KOH + 1.0 M ethanol; scan rate: 50 mV s⁻¹)