Electronic Supplementary Material (ESI) for CrystEngComm.

ConcavePt-Cu nanocuboctahedrons with high-index facets and their improved electrocatalytic performance

Xixi Wan, Dongfeng Zhang*, Lin Guo*

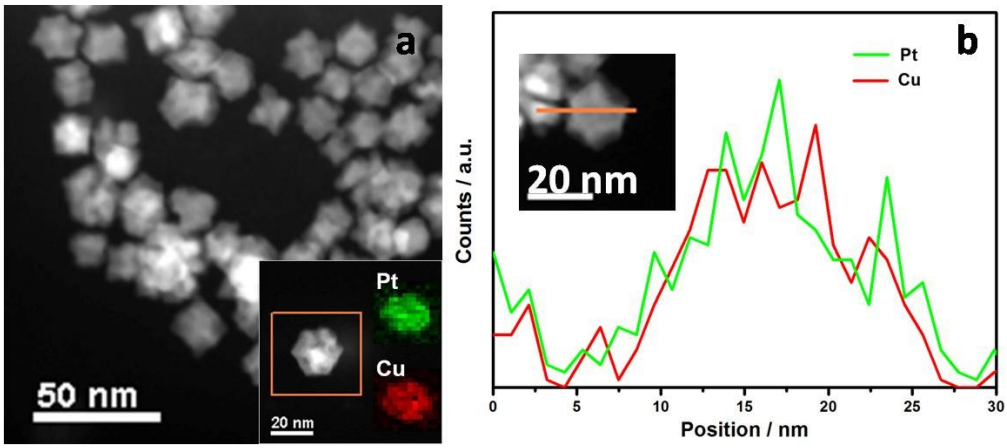

Fig.S1 (a)HAADF-STEM image of the Pt-Cu concave cuboctahedrons. The inset at the lower right corner is the EDS mapping profiles of Pt and Cu recorded on an individual particle. (b) STEM-EDS composition line profile scanning along the cross-section of a single Pt-Cu concave cuboctahedron as shown in the inset.

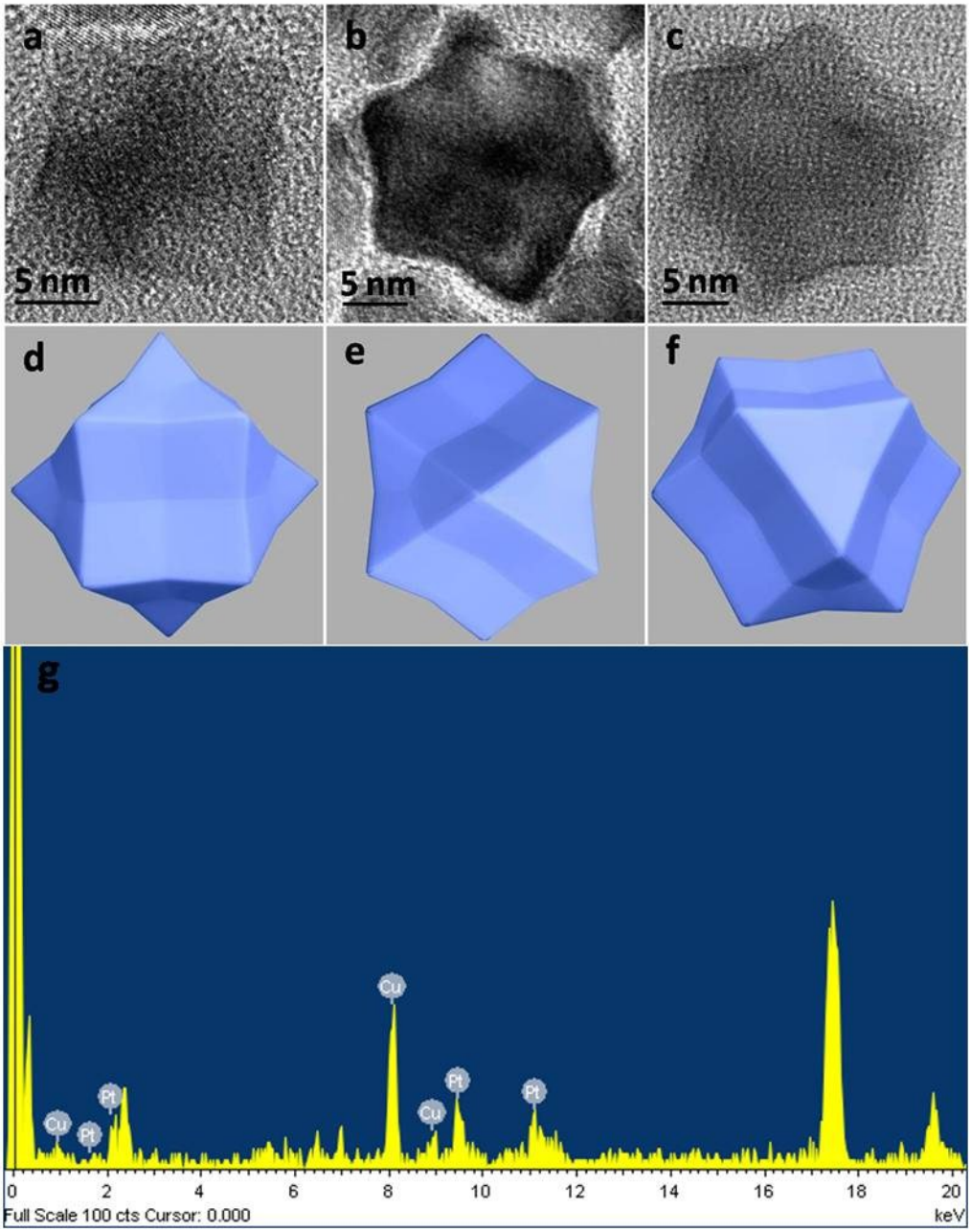

Fig.S2 (a–c) TEM images and (d–f) the corresponding 3D models of a single concave Pt-Cu nanocuboctahedron orientated along <100>, <110> and <111> directions, respectively. (g) EDS spectrum of the as-prepared Pt-Cuconcave nanocuboctahedrons, which shows that the atomic ratio ofPt and Cu is about 3 : 7. The sample was prepared on a molybdenum grid.

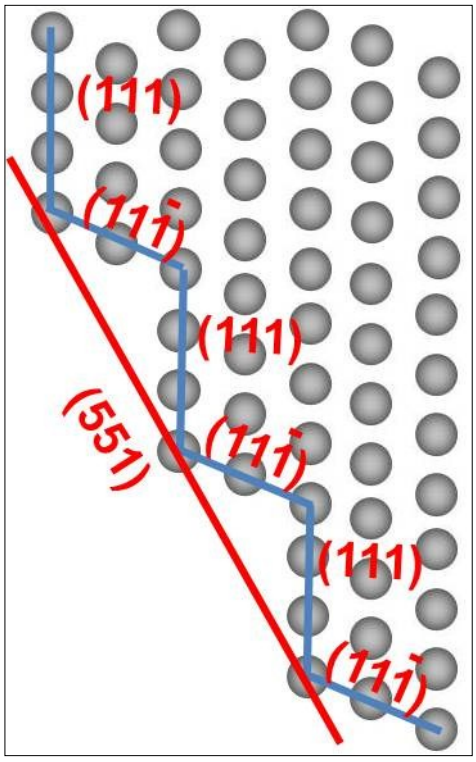

Fig.S3The corresponding atomic arrangement model of the (551) plane projected from the $<\bar{1}10>$ zone axis as shown in Fig. 1f.

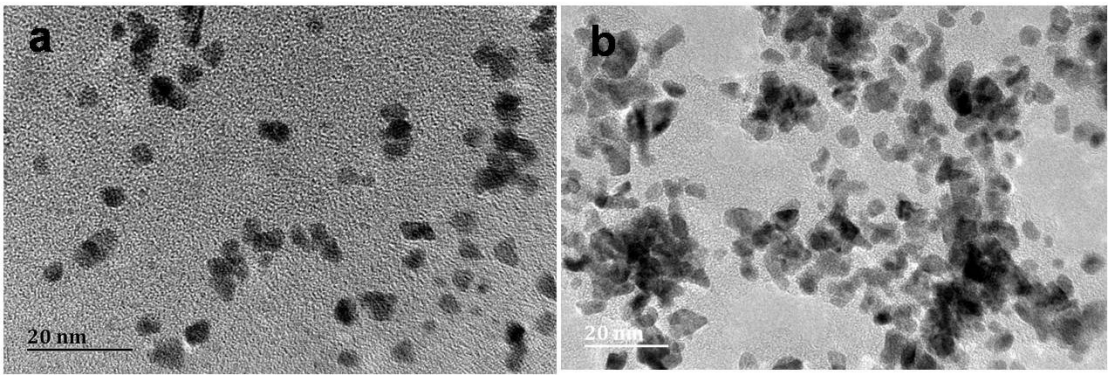

Fig.S4 TEM images of the products obtained at different duration under the similar conditions for Pt-Cu concave cuboctahedrons but by substitution of OAm with diphenyl ether. (a) 80 min, (b) 120 min.

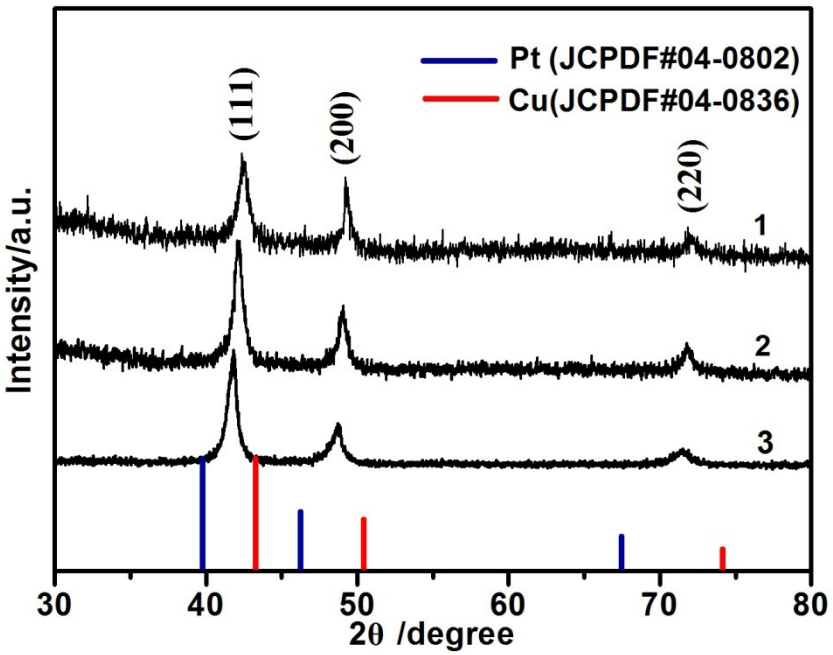

Fig.S5 XRD patterns of the products obtained at different duration stage: (1) 80 min, (2) 100 min, and (3) 120 min.

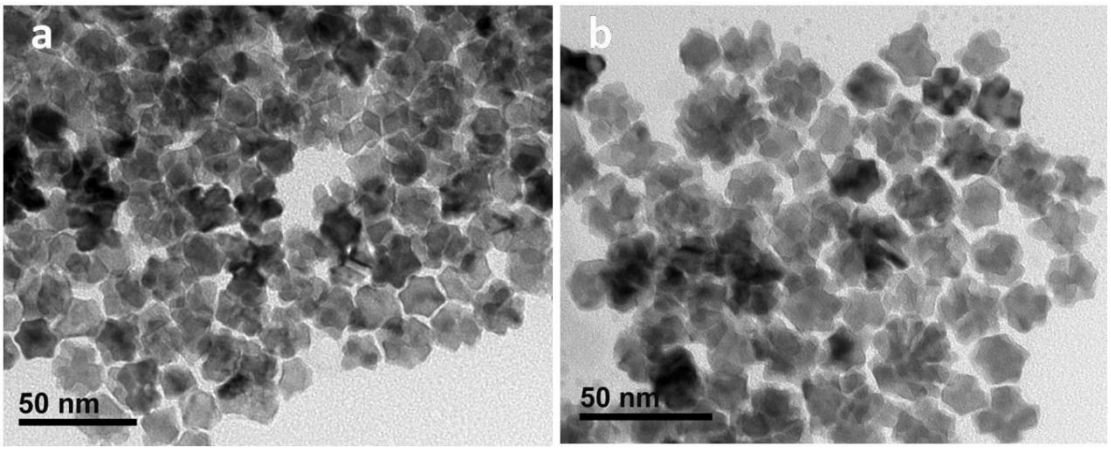

Fig.S6 TEM images of the products prepared under the similar conditions for Pt-Cu concave cuboctahedrons but with differentfeedratios of OAm/OA. (a) 3:1, (b) 4.5:1. The total volume of the solution was kept as 10 mL.

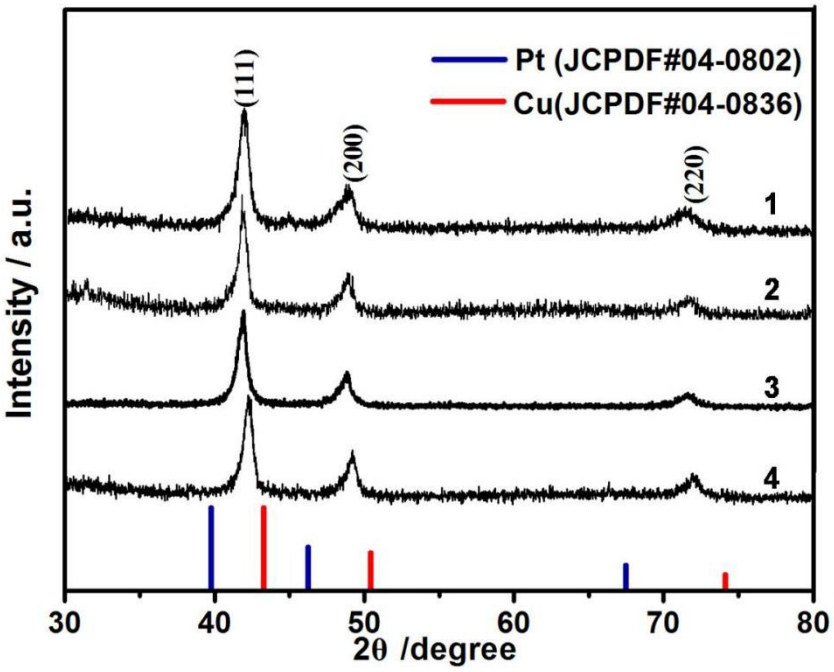

Fig.S7 XRD patterns of the products obtained under the similar conditions for Pt-Cu concave cuboctahedrons but with differentfeed ratios of OAm/OA. (1) 1:1, (2) 2:1, (3) 4:1, (4) 8:1. The total volume of the solution was kept as 10 mL.

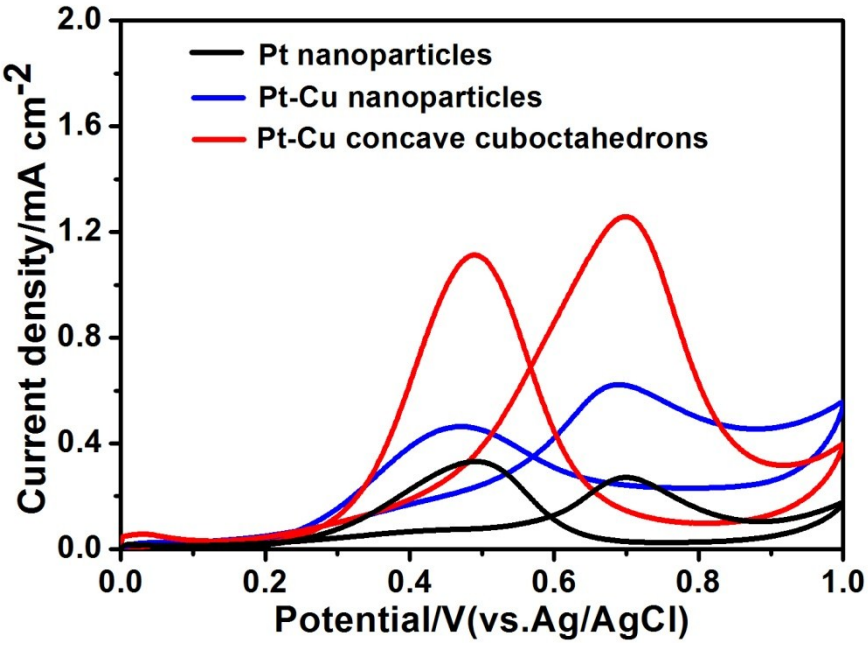

Fig.S8 Area-normalized Cyclic voltammetry curves of pure Pt nanoparticles, Pt-Cu nanoparticles and Pt-Cu concave cuboctahedron in 0.5 mol L^{-1} H_2SO_4 +1 mol L^{-1} CH_3OH. The scanning rate in all the cases is 50 mV· s^{-1}.

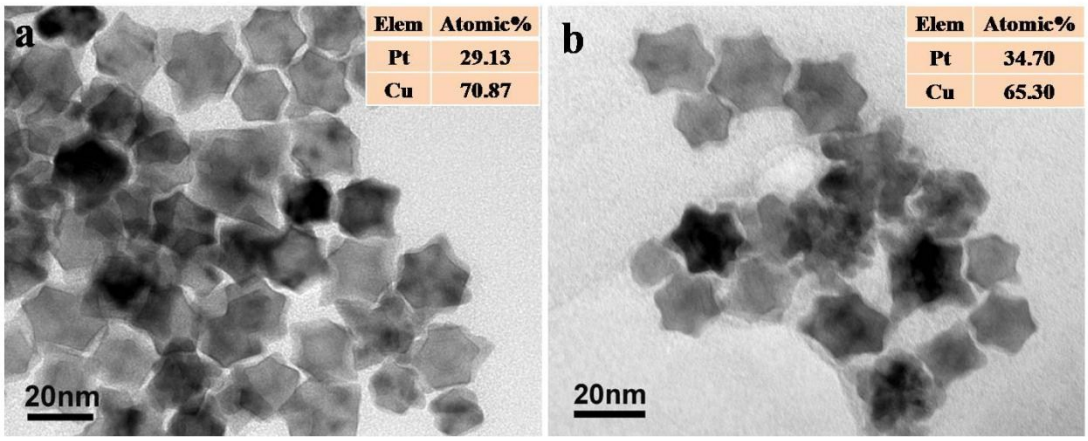

Fig.S9 TEM images and EDS data of the Pt-Cu concave nanocuboctahedrons (a) before, and (b) after chronoamperometry running.