Supporting Information

L-Lysine Mediated Synthesis of Pt Nanocuboids and Their Electrocatalytic Activity towards Ammonia Oxidation

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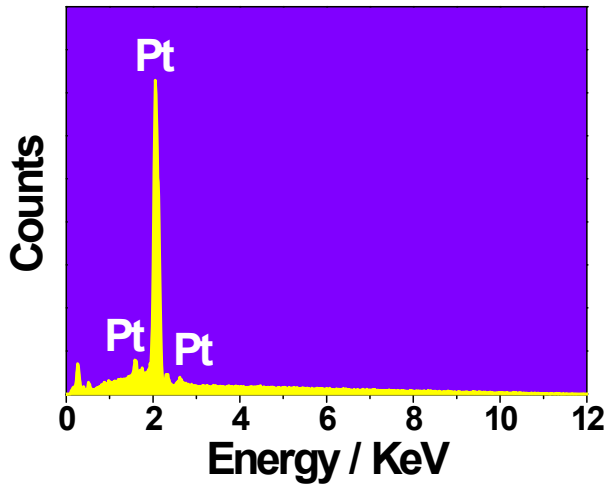

Fig. S1 EDX spectrum of the as-prepared Pt nanocuboids.

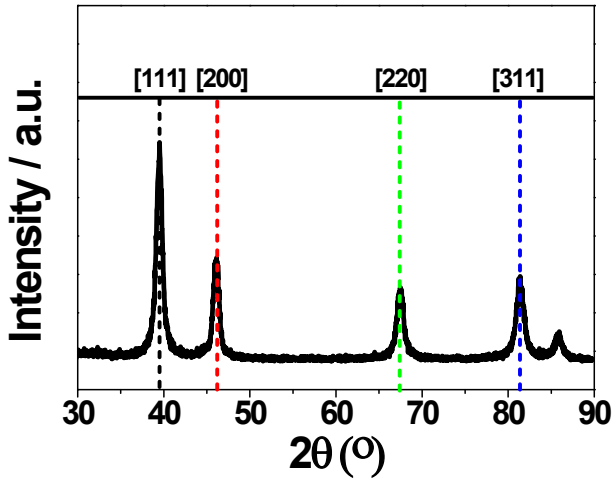

Fig. S2 XRD pattern of the commercial Pt black.

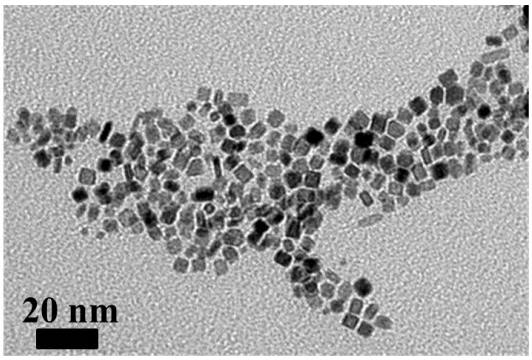

Fig. S3 TEM images of the product synthesized using the standard procedure but replacing HCHO with acetaldehyde.

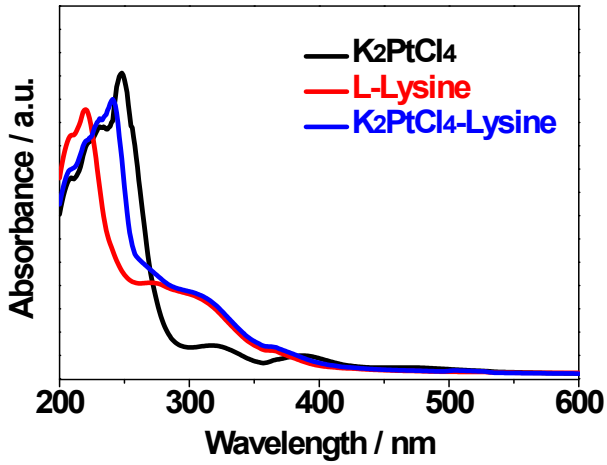

Fig. S4 UV–vis absorption spectra of K_2PtCl_4 solution, L-Lysine solution and the mixture solution of K_2PtCl_4 and L-Lysine.

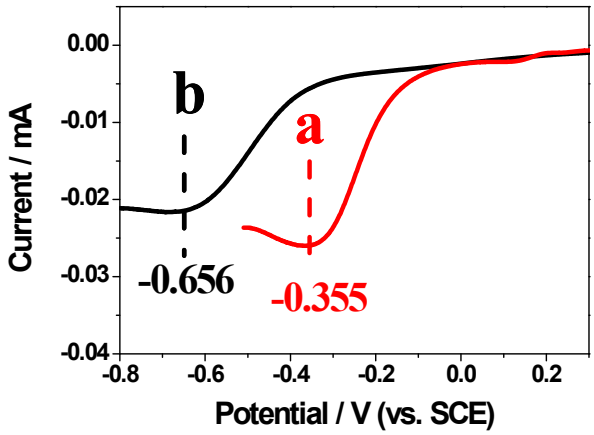

Fig. S5 Linear sweeping voltammograms of N_2-saturated (a) 0.005 M K_2PtCl_4 + 0.5 M KCl solution and (b) 0.005 M K_2PtCl_4 + 0.025 M L-Lysine + 0.5 M KCl solution at the glassy carbon electrode at a scan rate of 100 mV s^{-1} at pH 9.0, respectively.

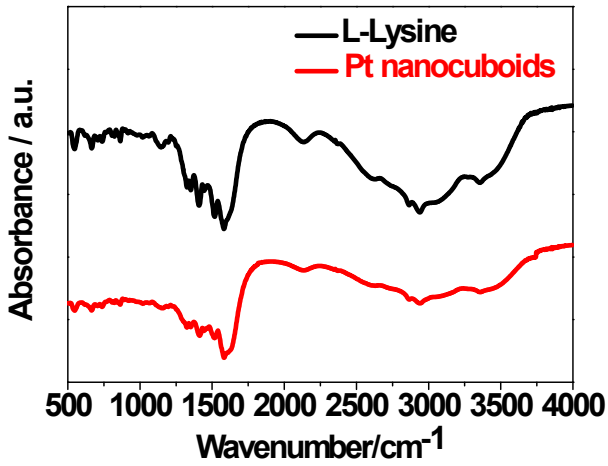

Fig. S6 FT-IR spectra of as-prepared Pt nanocuboids and L-Lysine.

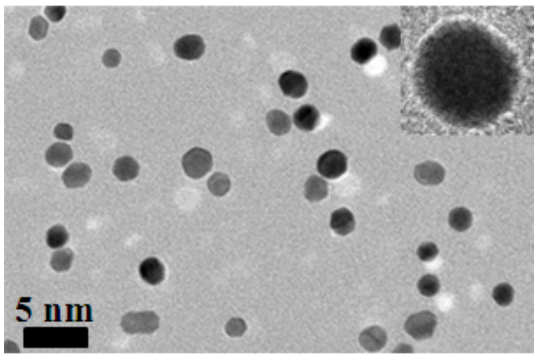

Fig. S7 TEM image of Pt nanocrystals prepared by displacing the air with O_2.

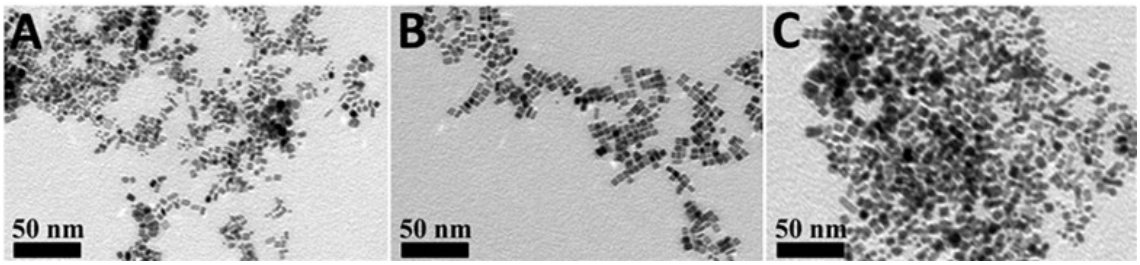

Fig. S8 TEM images of Pt nanocrystals prepared at different Pt^{II} precursor volumes: (A) 0.5 ml, (B) 1.0 ml and (C) 4.0 ml.

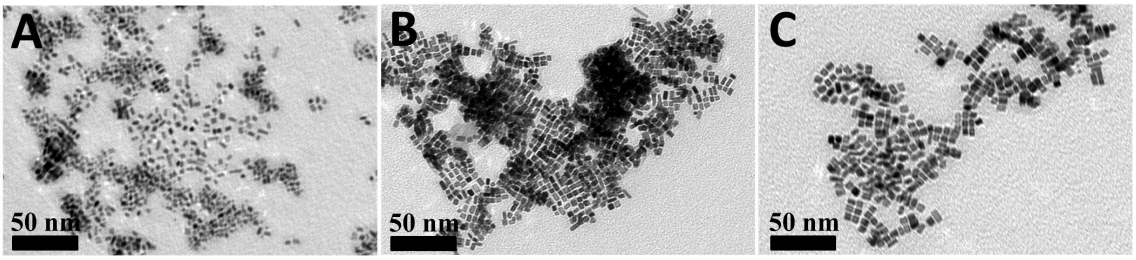

Fig. S9 TEM images of Pt nanocrystals prepared at different reaction times: (A) 140 ^{o}C, (B) 160 ^{o}C and (C) 180 ^{o}C.

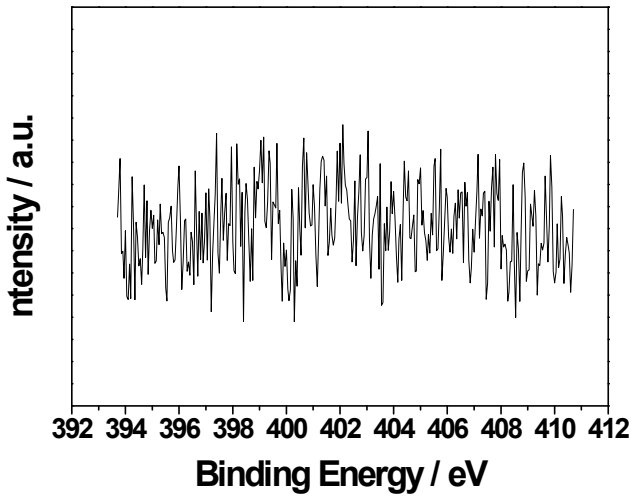

Fig. S10 XPS spectrum of Pt nanocuboids in the N1s region after UV/Ozone treatment.

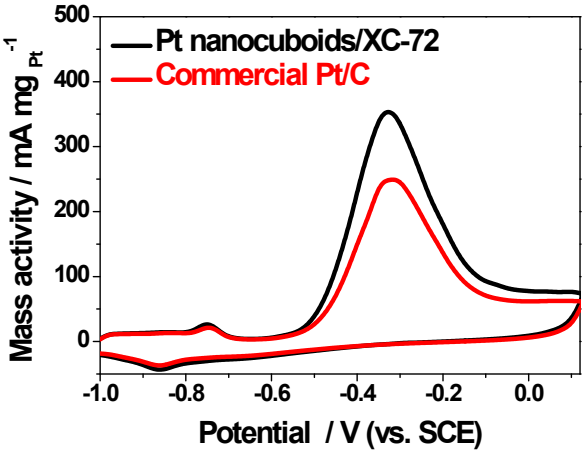

Fig. S11 Cyclic voltammograms for 20 wt.% Pt nanocuboids/XC-72 and 20 wt.% commercial Pt/C in N_2-saturated 1 M KOH + 0.1 M NH_4OH solution at the scan rate of 10 mV s^{-1}. For the preparation of 20% wt.% Pt nanocuboids/XC-72 catalyst, 4 mg of Vulcan XC-72 carbon black was added into 10 mL of 0.1 mg mL^{-1} Pt nanocuboids suspension with continued stirring for 2 h.

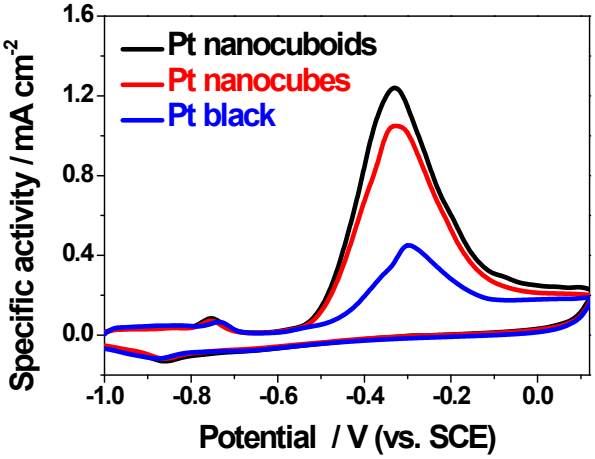

Fig. S12 Cyclic voltammograms for Pt nanocuboids, Pt nanocubes and Pt black in N_2-saturated 1 M KOH + 0.1 M NH_4OH solution at the scan rate of 10 mV s^{-1}, 5 nm Pt nanocubes were synthesized under the same conditions as in Fig. 3B.