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 $\text{K}_2\text{PtCl}_4$ solution, L-Lysine solution and the mixture solution of $\text{K}_2\text{PtCl}_4$ and L-Lysine.
Fig. S5 Linear sweeping voltammograms of N₂-saturated (a) 0.005 M K₂PtCl₄ + 0.5 M KCl solution and (b) 0.005 M K₂PtCl₄ + 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 O₂.

Fig. S8 TEM images of Pt nanocrystals prepared at different Pt\textsuperscript{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 °C, (B) 160 °C and (C) 180 °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$_4$OH 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$_4$OH solution at the scan rate of 10 mV s$^{-1}$, 5 nm Pt nanocubes were synthesized under the same conditions as in Fig. 3B.