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Supporting Information

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A General Approach to Size and Shape Controlled Synthesis of Pt Nanoparticles and Their Catalysis for Oxygen Reduction Reaction

Chao Wang,[†] Hideo Daimon,[‡] Taigo Onodera,[‡] Tetsunori Koda[†,‡] and Shouheng Sun[†,*]

Department of Chemistry, Brown University, Providence, Rhode Island 02912, USA; Technology & Development Division, Hitachi Maxell Ltd., 6-20-1 Kinunodai, Tsukubamirai, Ibaraki 300-2496, Japan

ssun@brown.edu

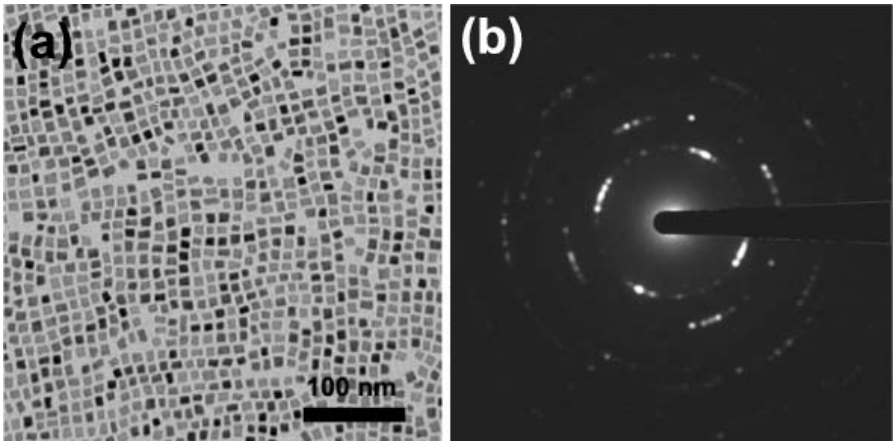

Figure S1. (a) TEM image of a general assembly of the 7 nm Pt nanocubes, and (b) the selected area electron diffraction (SAED) pattern of the nanocube assembly in (A).

[†] Brown University.

[‡] Hitachi Maxell, Ltd.

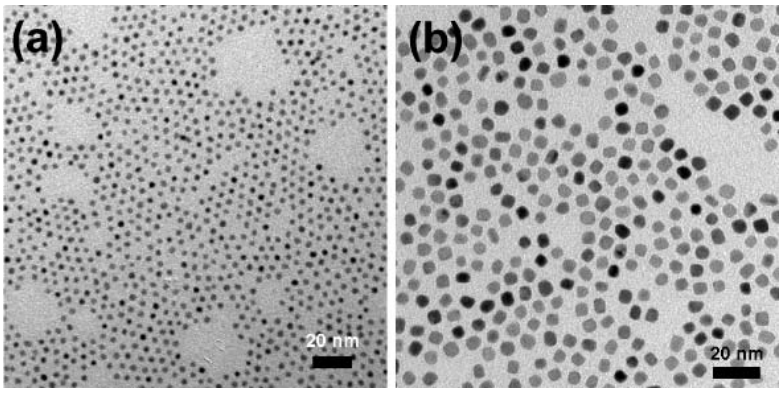

Figure S2. more TEM image of (a) 3 nm Pt polyhedrons and (b) 5 nm Pt truncated cubes.

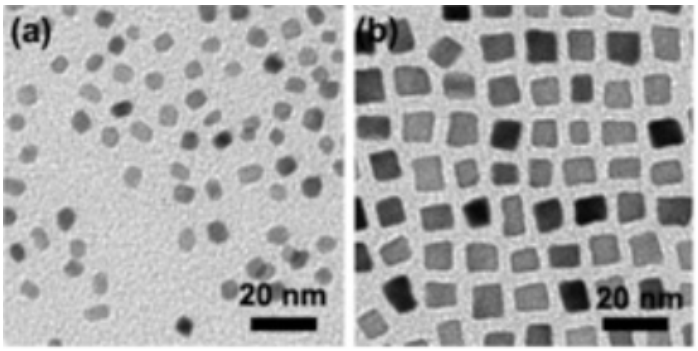

Figure S3. TEM images of the Pt NPs separated from (a) the 170°C solution and (b) the 200°C solution during the synthesis of 7 nm Pt nanocubes in ODE solvent.

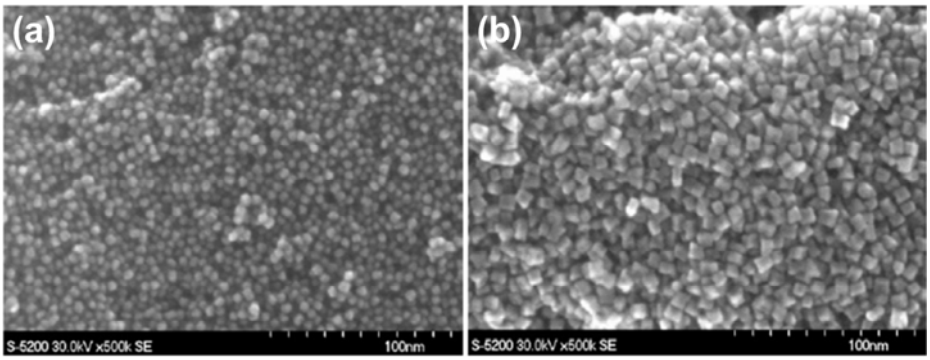

Figure S4. SEM images of (a) the 5 nm truncated cubic and (b) the 7 nm cubic Pt NPs after UV irradiation.

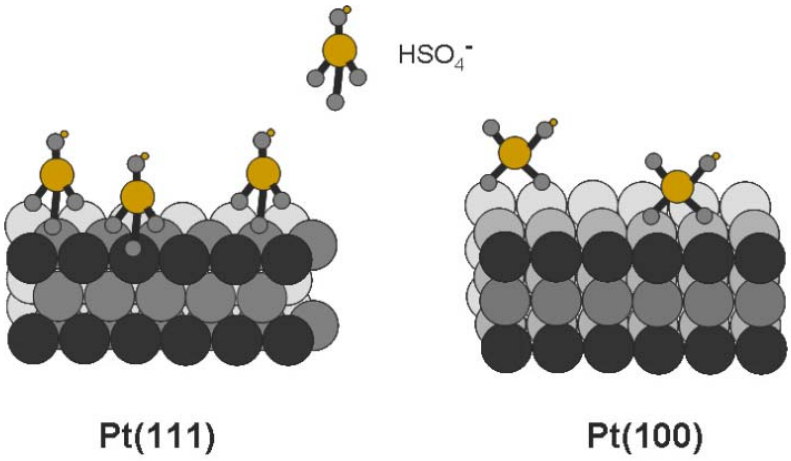

Figure S5. Schematic illustration of bisulfate anions adsorption on Pt (111) and (100) surface.

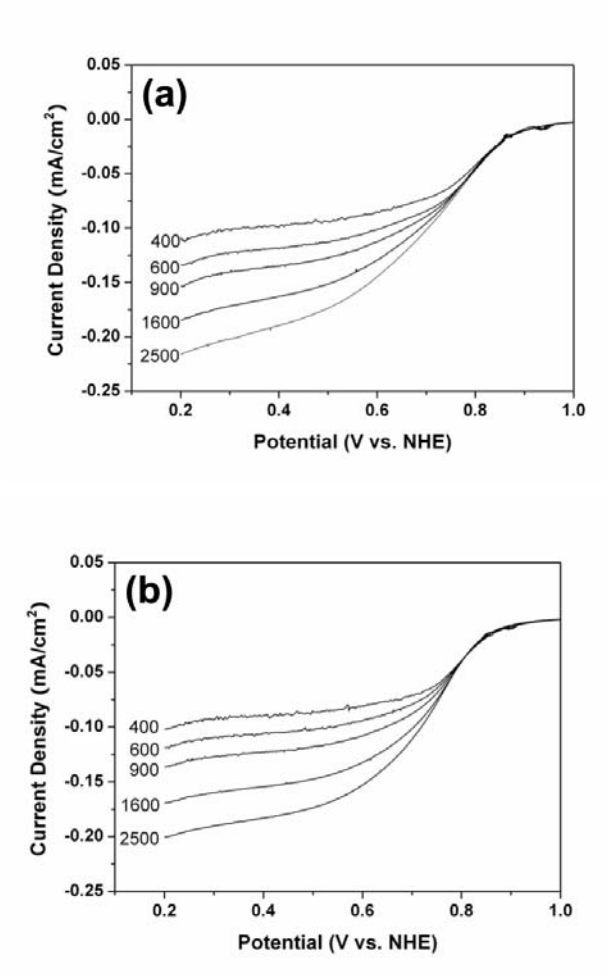

Figure S6. Disk current density in oxygen saturated 0.5 M H_2SO_4 as a function of potential and rotation rate for (a) 3 nm polyhedral and (b) 5 nm truncated cubic Pt

NPs. The scanning rate is 10 mV/s. The potential is against normal hydrogen electrode (NHE).

Calculating the electrochemically active surface area from the CV

The electrochemically active surface area of the catalyst can be obtained by:

$$S = \frac{Q_s}{210\ \mu C / cm^2}$$

where Q_s is the surface charge that can be calculated from the area under the CV curve as shown in Figure S6 by:

$$Q_s = \frac{\int IdE}{v}$$

where v is the scanning rate.[1,2]

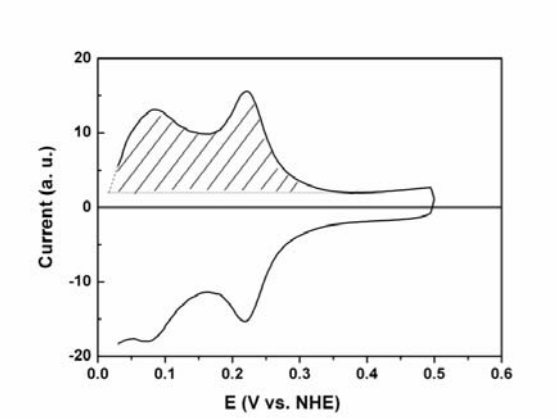

Figure S7. CV curve of 7 nm pt nanocubes adopted from Figure 4.

1. Watanabe, M.; Tomikawa, M.; Motoo, S. *J. Electroanal. Chem.* **1985**, *182*, 193-196.
2. Lee, E. P.; Peng, Z.; Cate, D. M.; Yang, H.; Campbell, C. T.; Xia, Y. *J. Am. Chem. Soc.* **2007**, *129*, 10634-10635.