Pd@Rh Core-Shell Nanocrystals with Well-Defined Facets and Their Enhanced Catalytic Performance towards CO Oxidation

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Table S1. The average number (n) of Rh atomic layers calculated from the ICP−MS data for the Pd and Rh contents in the Pd@Rh core-shell nanocrystals, the weight percentage (wt%) of Rh obtained from the ICP−MS data, and the wt% of Rh derived from the average number of Rh atomic layers and the size of the Pd seeds such as octahedra and cubes.

<table>
<thead>
<tr>
<th>Samples</th>
<th>Average number of Rh atomic layers (n)</th>
<th>wt% of Rh obtained from the ICP−MS data</th>
<th>wt% of Rh calculated from the value of n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pd@Rh octahedra</td>
<td>2.1</td>
<td>42.2</td>
<td>39.8 (n=2)</td>
</tr>
<tr>
<td>Pd@Rh cubes</td>
<td>2.9</td>
<td>36.6</td>
<td>37.8 (n=3)</td>
</tr>
</tbody>
</table>
**Fig. S1** TEM images of (A) Pd octahedra and (B) Pd cubes with average edge lengths of 6.4 and 7.2 nm, respectively, which served as seeds for the overgrowth of Rh.
**Fig. S2** TEM image of Pd@Rh core-shell octahedra at a relatively low magnification to show uniformity in both size and shape.
**Fig. S3** TEM image of a product containing both Pd@Rh core-shell octahedra and small Rh nanocrystals when a larger volume (81 μL) of Rh(OAc)₃ solution was used while all other conditions were kept the same as the standard protocol.
Fig. S4 TEM images of Pd@Rh core-shell octahedra prepared using different Rh precursors, including (A) RhCl$_3$, (B) Rh(NO$_3$)$_3$, and (C, D) Rh(acac)$_3$, respectively, using a protocol similar to what was used for the Pd@Rh octahedra shown in Fig. 1.
Fig. S5 TEM images of (A) Pd cubes and (B) Pd cuboctahedra. TEM images of Pd@Rh octahedra grown from the (C) cubic and (D) cuboctahedral, respectively, seeds of Pd, with a protocol similar to what was used for the Pd@Rh octahedra shown in Fig. 1.
Fig. S6 Arrhenius plots for determining the ignition temperatures (ITs) of CO oxidation for (A) octahedral Pd@Rh/SBA15, (B) cubic Pd@Rh/SBA15 (C) cubic Rh/SBA15, and (D) Rh/C. The trend line analysis displays percentage conversion as a function of the reciprocal of temperature in Kelvin. (E) IT of CO oxidation for Pt/Al₂O₃ catalysts, which was supposed to be at 160 °C.
**Fig. S7** TEM and high-resolution TEM images of (A, B) Pd@Rh/SBA15 octahedra and (C, D) Pd@Rh/SBA15 cubes after going through the catalytic CO oxidation reaction.