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## **Electronic Supplementary Information**

## A Balancing Act: Manipulating Reactivity of Shape-Controlled

## Metal Nanocatalysts through Bimetallic Architecture

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**Figure S1.** HAADF STEM images of (a) 37 nm Au@Pd octahedra and (b) 40 nm Au@Pd octahedra and (c) 42 nm Au@Pd octahedra.



**Figure S2.** SEM images of  $TiO_2$  supported (a) 37 nm Au@Pd octahedra and (b) 40 nm Au@Pd octahedra, and (c) 42 nm Au@Pd octahedra after 2-hexyne hydrogenation.



**Figure S3.** Plot of a relative conversion of reagent and products, as a function of time for (a) 40 nm Au@Pd octahedra and (b) 42 nm Au@Pd octahedra.



Figure S4. TEM image of 37 nm Au@Pd octahedra after electrocatalysis.