Electronic Supplementary Material (ESI) for New Journal of Chemistry.


# Supporting Information

## Analysis of the reaction products

The liquid products collected from the reaction mixture were analyzed by a gas chromatograph (Shimadzu GC-14C). The conditions for the analysis were as follows: a 50 m HP-PONA capillary column, a flame ionization detector, 30 mL/min $N_2$ flow as a carrier gas, detector temperature 533 K, and the oven temperature programmed from 313 K to 522 K at the speed of 10 K/min. The products were identified by gas chromatography/mass spectrometry (Agilent GC/MS 5890). The errors of the MS measurement were in the range of $-2.7\times10^{-4}$ to $3.9\times10^{-4}$. The products were quantitatively analyzed by standard curves of each compound. The carbon balance of all examined catalysts was in the range of 94 to 98%.

The furfural conversion, the selectivity and yield of furfural alcohol were calculated using the formulas as follows:

$$\text{Conversion} = \frac{n_{(\text{furfural})before} - n_{(\text{furfural})after}}{n_{(\text{furfural})before}} \times 100\%$$

$$\text{Selectivity} = \frac{n_{i\text{-product}}}{\sum_i n_{i\text{-product}}} \times 100\%$$

Here, $n_{(\text{furfural})before}$ and $n_{(\text{furfural})after}$ were the molar amount of furfural before and after reaction, respectively. *i*-product represents furfural hydrogenation products, and $n_{i\text{-product}}$ is the molar amount of corresponding product *i*-product.

## Catalyst recyclability

The recyclability of Pd-Co@C and Co@C were evaluated, respectively. Following the first reaction, the used catalyst was collected from the reaction mixture by centrifugation. After washing with isopropanol, the catalyst was further used directly in the next recycle. After four recycles, both Pd-Co@C and Co@C displayed high stability (Fig. S1).

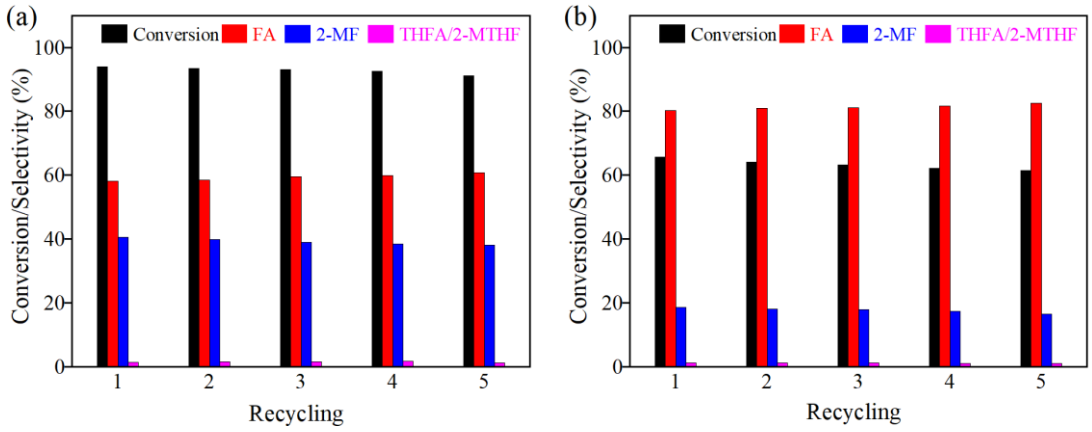


Fig. S1 Recycling of (a) Pd-Co@C (773 K) and (b) Co@C (773 K) under $H_2$. Reaction conditions: 10 mg catalyst, 5 mmol FF, 10 mL isopropanol, 1 MPa $H_2$, 453 K, 4 h.