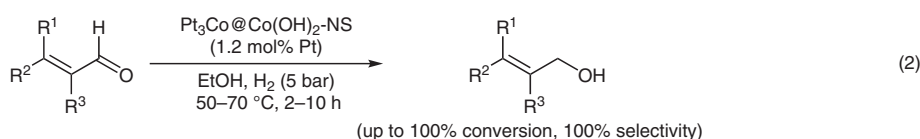
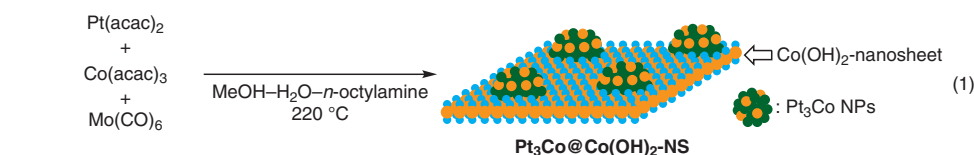


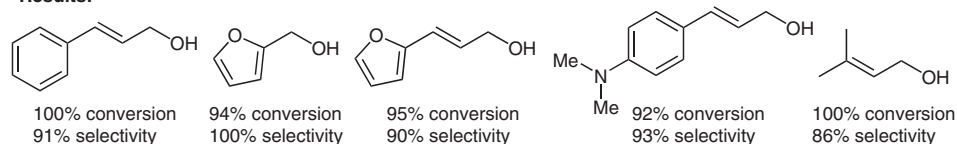
H. WANG, S. BAI, Y. PI, Q. SHAO, Y. TAN, X. HUANG\* (SOOCHOW UNIVERSITY, JIANGSU AND HUNAN NORMAL UNIVERSITY, CHANGSHA, P. R. OF CHINA)

A Strongly Coupled Ultrasmall Pt<sub>3</sub>Co Nanoparticle-Ultrathin Co(OH)<sub>2</sub> Nanosheet Architecture Enhances Selective Hydrogenation of  $\alpha,\beta$ -Unsaturated Aldehydes  
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## Selective Catalytic Hydrogenation of $\alpha,\beta$ -Unsaturated Aldehydes



### Results:



**Significance:** Pt<sub>3</sub>Co nanoparticles strongly grafted with Co(OH)<sub>2</sub> nanosheet [Pt<sub>3</sub>Co@Co(OH)<sub>2</sub>-NS] were prepared by mixing Pt(acac)<sub>2</sub>, Co(acac)<sub>3</sub>, and Mo(CO)<sub>6</sub> in MeOH–H<sub>2</sub>O–octylamine at 220 °C (eq. 1). Pt<sub>3</sub>Co@Co(OH)<sub>2</sub>-NS catalyzed the selective hydrogenation of  $\alpha,\beta$ -unsaturated aldehydes to give the corresponding allylic alcohols with  $\leq 100\%$  conversion and  $\leq 100\%$  selectivity (eq. 2; 5 examples).

**Comment:** The catalyst was characterized by means of TEM, HRTEM, XRD, XPS, AFM, ATR-IR, and ICP-AES analyses. In the hydrogenation of cinnamaldehyde, the selectivity of Pt<sub>3</sub>Co@Co(OH)<sub>2</sub>-NS for the formation of cinnamyl alcohol was superior to that of the other Pt catalysts such as Pt nanoparticles (NPs), Pt<sub>3</sub>Co NPs, Pt NPs on Co(OH)<sub>2</sub>-NS, or Pt<sub>3</sub>Co NPs on Co(OH)<sub>2</sub>-NS. In the hydrogenation of cinnamaldehyde, the catalyst was recovered by centrifugation and reused nine times without loss of its activity. TEM images of the recovered catalyst after tenth run showed almost no changes.