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 $CeO_2-Supported\ Pd(II)-on-Au\ Nanoparticle\ Catalyst\ for\ Aerobic\ Selective\ \alpha,\beta-Desaturation\ of\ Carbonyl\ Compounds\ Applicable$ to Cyclohexanones

ACS Catal. 2020. 10. 5057-5063.

## $\alpha,\beta$ -Desaturation of Ketones Catalyzed by Palladium(II) on Gold Nanoparticles Supported on Ceria

## Selected results:

Significance: Palladium(II) on gold nanoparticles supported on CeO<sub>2</sub> (Pd/Au/CeO<sub>2</sub>) was prepared according to equation 1. Pd/Au/CeO<sub>2</sub> catalyzed the desaturation of ketones 1 under open-air conditions to give the corresponding  $\alpha,\beta$ -unsaturated ketones 2 in up to >99% yield (eq. 2).

Comment: Pd/Au/CeO<sub>2</sub> was characterized by XPS, XANES, XRD, HAADF-STEM, STEM-EDS and ICP-AES analyses. In the desaturation of cyclohexanone (1a) to cyclohex-2-en-1-one (2a), the catalyst showed a high turnover frequency (122 h<sup>-1</sup> based on Pd). This catalysis offers a viable alternative to the Saegusa-Ito oxidation.

SYNFACTS Contributors: Yasuhiro Uozumi, Ryoko Niimi Synfacts 2020, 16(08), 0947 Published online: 21.07.2020 DOI: 10.1055/s-0040-1706878; Reg-No.: Y07120SF

**Polymer-Supported** Synthesis

## Key words

palladium catalysis gold catalysis desaturation cyclohexanones cyclohexenones dioxygen

