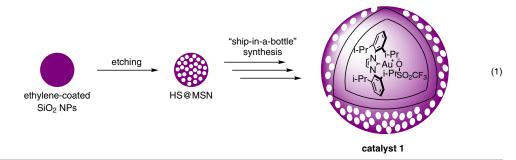
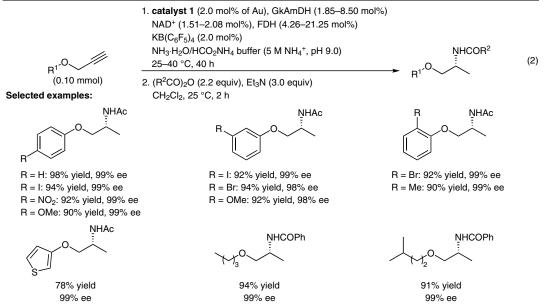
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A Chemoenzymatic Cascade Combining a Hydration Catalyst with an Amine Dehydrogenase: Synthesis of Chiral Amines Angew. Chem. Int. Ed. 2022, 61, e202114809 DOI: 10.1002/anie.202114809.

## **Catalytic Hydration/Enantioselective Reductive Amination Cascade Reaction of Propargyl Ethers**





**Significance:** An Au/carbene complex was encapsulated within the cavities of hollow-shell mesoporous silica nanoparticles to form catalyst 1 (eq. 1). By using a combination of catalyst 1 and the amine dehydrogenase GkAmDH, a hydration/enantioselective reductive amination cascade reaction of propargyl ethers was promoted in the presence of nicotinamide adenine dinucleotide (NAD<sup>+</sup>) and formate dehydrogenase (FDH) to give the corresponding chiral amines in ≤98% yield and 99% ee (eq. 2).

Comment: Catalyst 1 promoted the hydration of phenyl propargyl ether to give phenoxyacetone. GkAmDH then catalyzed the enantioselective reductive amination of phenoxyacetone. The cascade reaction using the homogeneous Au/carbene complex IPrAuOTf with GkAmDH did not give the desired amines, due to deactivation of GkAmDH. The hollow-shell silica of catalyst 1 prevents interaction with the Au/carbene complex so that GkAmDH retains its catalytic properties to complete the chemoenzymatic cascade.

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Category

**Polymer-Supported** Synthesis

## Key words

asymmetric catalysis hvdration reductive amination amine dehydrogenase propargyl ethers

