Catalytic Semireduction of Alkynes to Alkenes

Significance: A novel copper-catalyzed semireduction of alkynes to alkenes has been disclosed. 0.5 to 2 mol% of a copper catalyst in combination with polymethylhydrosiloxane and isobutyl alcohol efficiently reduced terminal and internal alkynes, even in the presence of nitro and iodo groups.

Comment: The authors propose the following mechanism: the silane transfers its hydride to the copper catalyst and a subsequent hydrocupration of the alkyne takes place. Protonation of this alkynyl-copper intermediate by the alcohol forms a copper alkoxide and the desired product.

Selected examples:

- \( \text{PhCH=CHOPh} \) 93% yield
- \( \text{PhCH=CHOTBS} \) 98% yield
- \( \text{PhCH=CHI} \) 96% yield
- \( \text{PhOCH=CH\text{NBoc}2} \) 87% yield
- \( \text{PhCH=CH\text{NBoc}2} \) 81% yield
- \( \text{PhCH=CH\text{NBoc}2} \) 94% yield