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 alkenyl-copper intermediate by the alcohol forms a copper alkoxide and the desired product.

Selected examples:

- 93% yield
- 98% yield
- 96% yield
- 87% yield
- 81% yield
- 94% yield

R1, R2 = Alk, alkenyl residues
R3 = i-Bu, t-Bu