Catalytic Semireduction of Alkynes to Alkenes

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\begin{align*}
\text{R}^1 &\text{= Alk, alkenyl residues} \\
\text{R}^2 &\text{= } \text{t}-\text{Bu, i-Bu} \\
\text{R}^3 &\text{= i-Bu, t-Bu}
\end{align*}
\]

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.