Hydrosilylation of Terminal Alkynes

Aromatic alkynes:

Ar\(\equiv\)H + PhSiH\(_3\) (1.0 equiv) THF, r.t., 6 h

Aliphatic alkynes:

R\(_1\)\(\equiv\)H + PhSiH\(_3\) (1.0 equiv) THF, 70 °C, 6 h

R\(_1\) = various substituents

Proposed reaction mechanism:

Selected examples:

Aromatic alkynes:

- F\(_3\)CO
  - 75% yield (Z/E = 98:2)
- Cl
  - 82% yield (Z/E > 99:1)
- HO
  - 67% yield (Z/E > 99:1)
- S
  - 80% yield (Z/E > 99:1)

Aliphatic alkynes:

- 91% yield (Z/E = 96:4)
- 95% yield (Z/E = 97:3)
- TBSO
  - 86% yield (Z/E > 99:1)
- TBSO
  - 77% yield (Z/E > 99:1)

Significance: Ge and co-workers report a Z-selective hydrosilylation of terminal alkynes with catalysts generated from bench-stable Co(OAc)\(_2\) and pyridine-2,6-dimine ligands.

Comment: The authors propose a silylmethylation pathway with a cobalt(II) silyl intermediate for the hydrosilylation and hydrogenation of alkynes and alkenes.

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