Oxidative Cycloaddition of 1,1,3,3-Tetramethyldisiloxane to Alkynes Catalyzed by Supported Gold Nanoparticles

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Cycloaddition of Tetramethyldisiloxane to Alkynes with [Au]/TiO$_2$

**Significance:** TiO$_2$-supported gold nanoparticles ([Au]/TiO$_2$) catalyzed the oxidative cycloaddition of 1,1,3,3-tetramethyldisiloxane (TMDS) to alkynes 1 to give the corresponding cycloadducts 2 in up to 99% isolated yield (22 examples, eq. 1).

**Comment:** The authors proposed a reaction pathway for the present oxidative cycloaddition as follows (eq. 2): (1) oxidative addition of TMDS to [Au] giving H-[Au]-Me$_2$SiOSiMe$_2$ (A); (2) insertion of alkynes 1 into the Si–Au bond forming gold adducts B; (3) intramolecular elimination of H$_2$ and [Au] to give cycloadducts 2.

**Proposed reaction pathway:**

**Selected examples:**

- **2a** (30 min, 84% isolated yield)
- **2b** (40 min, 99% isolated yield)
- **2c** (40 min, 96% isolated yield)
- **2d** (40 min, 81% isolated yield)
- **2e** (20 min, 85% isolated yield)
- **2f** (40 min, 91% isolated yield)
- **2g** (40 min, 98% isolated yield)
- **2h** (30 min, 72% isolated yield)
- **2i** (1 h, 87% isolated yield)
- **2j** (40 min, 78% isolated yield)
- **2k** (1 h, 42% isolated yield)
- **2l** (24 h, 88% isolated yield)