Spirocyclization of Alkyne-Tethered Aromatics with Silver Nitrate/Silica

**Significance:** Silica-supported silver nitrate (AgNO₃/SiO₂) catalyzed the dearomatizing spirocyclization of alkyne-tethered aromatics to give the corresponding spirocycles in 86–100% yield (eqs. 1–4).

**Comment:** The continuous-flow reaction of 1-(1H-indol-3-yl)-4-phenylbut-3-yn-2-one on a column of AgNO₃/SiO₂ gave 5-phenyl-3H-spirocyclopent-4-ene-1,3′-indol]-3-one in quantitative yield (eq. 5).

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**Indoles:**

\[ 	ext{Indoles:} \]

\[ \text{Ph} \]

30 min, r.t., 98% yield 10 min, r.t., 94% yield 35 min, r.t., 95% yield 24 h, r.t., 100% yield (dr = 1.06) 24 h, 45 °C, 100% yield

**Phenols:**

\[ \text{Ph} \]

R¹ = Ph, R² = H, 24 h, 40 °C, 94% yield R¹ = o-Pr, R² = H, 2 h, r.t., 99% yield R¹ = 4-MeOC₆H₄, R² = OMe, 24 h, 40 °C, 86% yield

\[ \text{BocN} \]

7 h, r.t., 99% yield 2 h, r.t., 90% yield 2 h, r.t., 96% yield

**Pyrroles:**

\[ \text{Pyrroles:} \]

\[ \text{Ph} \]

R = Ph, 90% yield R = 4-MeOC₆H₄, 91% yield R = 4-FC₆H₄, 96% yield R = n-Bu, 91% yield

\[ \text{Ph} \]

R = Ph, 20 min, 100% yield R = 4-FC₆H₄, 15 min, 100% yield R = n-Bu, 10 min, 100% yield

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**Comment:** The continuous-flow reaction of 1-(1H-indol-3-yl)-4-phenylbut-3-yn-2-one on a column of AgNO₃/SiO₂ gave 5-phenyl-3H-spirocyclopent-4-ene-1,3′-indol]-3-one in quantitative yield (eq. 5).