Supporting Information for

Sequential Actions of Palladium and Cobalt Nanoparticles- Immobilized on Silica: One-
Pot Synthesis of Bicyclic Enones by Catalytic Allylic Alkylation and Pauson-Khand
Reaction

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Characterization of the product in entry 7 in Table 1: Yield: 87%. ^1H NMR (CDCl_3): δ 5.72 (m, 1 H), 5.06 (m, 2 H), 3.69 (s, 3 H), 2.61 (m, 1 H), 2.40 (m, 4 H), 1.77 (t, J = 2.6 Hz, 3 H) ppm; ^{13}C NMR (CDCl_3): δ 174.5, 134.6, 117.3, 75.7, 65.1, 51.5, 35.2, 20.8, 3.4 ppm; HRMS for $\text{C}_{10}\text{H}_{14}\text{O}_2$: calcd. 166.0994, obsd. 166.0995.

Characterization of an alkyne substrate in entry 5 in Table 3: ^1H NMR (CDCl_3): δ 7.78 (d, J = 8.2 Hz, 2 H), 7.30 (d, J = 8.2 Hz, 2 H), 4.77 (t, J = 5.5 Hz, 1 H), 3.79 (d, 5.9 Hz, 2 H), 2.42 (s, 3 H), 1.95 (m, 2 H), 1.28 (m, 4 H), 0.85 (m, 3 H) ppm; ^{13}C NMR (CDCl_3): δ 143.4, 136.9, 129.7, 127.4, 85.4, 73.9, 33.4, 30.3, 21.8, 21.4, 18.1, 13.7 ppm; HRMS

for ($\text{C}_{14}\text{H}_{19}\text{NO}_2\text{S} + \text{H}$): calcd. 266.1215, obsd. 266.1216.

Characterization of an alkyne substrate in entry 6 in Table 3: ^1H NMR (CDCl_3): δ 7.81 (d, $J = 8.3$ Hz, 2 H), 7.27 (d, $J = 8.3$ Hz, 2 H), 7.25 (m, 3 H), 7.13 (m, 2 H), 4.77 (t, $J = 5.9$ Hz, 1 H), 4.07 (d, $J = 6.1$ Hz, 2 H), 2.35 (s, 3 H) ppm; ^{13}C NMR (CDCl_3): δ 143.7, 131.5, 129.7, 128.1, 127.5, 125.9, 122.1, 84.7, 83.2, 33.8, 21.4 ppm; HRMS for $\text{C}_{16}\text{H}_{15}\text{NO}_2\text{S}$: calcd. 285.0824, obsd. 285.0819.