Supporting Information Section

A Facile Method for the Synthesis of Thiocarbamates: Palladium-Catalyzed Reaction of Disulfide, Amine and Carbon Monoxide

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General procedure:

$^1$H- and $^13$C-NMR spectra were recorded on 400 and 270 MHz spectrometers using CDCl$_3$ as solvent with tetramethylsilane as the internal standard. IR spectra were obtained on an FT-IR spectrophotometer. Mass spectra were measured by GC-MS. Gas chromatography (GC) was carried out on an instrument with a flame-ionizing detector using a capillary column. Diaryl and dialkyl disulfides, and palladium complexes were commercially available and used without purification. Amines and solvents were purified by the usual methods.

S-t-Butyl-N,N-diethylthiocarbamate (3j)
$^1$H-NMR (CDCl$_3$) δ 1.15 (t, J=6.8 Hz, 6H), 1.51 (s, 9H), 3.48 (q, J=6.8 Hz, 4H). $^13$C NMR (CDCl$_3$) δ 30.6, 47.2, 167.2. IR (neat) 859, 1112, 1248, 1361, 1403, 1460, 1644, 1742, 2854, 2925 cm$^{-1}$. Anal. Calcd for C$_9$H$_{19}$NOS: C, 57.10; H, 10.12; N, 7.40. Found: C, 57.26; H, 10.45; N, 7.26.

S-Cyclohexyl-N,N-diethylthiocarbamate (3k)
$^1$H-NMR (CDCl$_3$) δ 1.16 (t, J=6.4 Hz, 6H), 1.22-1.39 (m, 1H), 1.43 (q, J=6.4 Hz, 4H), 1.57-1.61 (m, 1H), 1.69-1.77 (m, 2H), 1.98-2.02 (m, 2H), 3.36-3.45 (m, 5H). $^13$C-NMR (CDCl$_3$) δ 13.4, 25.7, 26.2, 33.9, 42.1, 43.6, 166.9. IR (neat) 665, 755, 859, 1097, 1116, 1221, 1248, 1380, 1405, 1449, 1650, 2853, 2932, 2974 cm$^{-1}$. Anal. Calcd for C$_{11}$H$_{21}$NOS: C, 61.35; H, 9.83; N, 6.50. Found: C, 61.74; H, 9.65; N, 6.71.
References