Supramolecular Double Helical Copper Complexes for Asymmetric Catalysis

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Electronic Supplementary Information (ESI)

$[Cu_2L3_2](ClO_4)_2$: ^{1}H NMR (300 MHz, CD_2Cl_2): δ 0.08 (s, 12H), 0.09-0.12 (m, 4H), 0.26-0.35 (m, 4H), 0.45 (t, *J*=6.7 Hz, 12H), 0.50-0.59 (m, 4H), 1.08 (d, *J*=10.3 Hz, 8H), 1.13-1.14 (m, 4H), 1.35 (s, 12H), 1.80 (d, *J*=11.1 Hz, 4H), 2.14 (t, *J*=6.16 Hz, 4H), 2.36-2.40 (m, 4H), 2.45-2.52 (m, 4H), 2.82 (t, *J*=5.6 Hz, 4H), 7.56 (d, *J*=8.21 Hz, 4H), 8.10 (d, *J*=7.9 Hz, 4H), 8.51 (d, *J*=7.62 Hz, 4H), 8.64 (t, *J*=7.9 Hz, 2H); Anal. Calcd for $C_{74}H_{94}N_6Cu_2Cl_2O_8 \cdot (MeCN)_{0.5}$: C, 63.71; H, 6.76; N, 6.44. Found: C, 62.52; H, 6.62; N, 6.50%; ESI-MS m/z: 1338 (M^+-ClO_4^-).

$[Cu_2L5_2](PF_6)_2$: ^{1}H NMR (300 MHz, $CDCl_3$): δ 0.25 (s, 12H), 0.76 (d, *J*=6.9 Hz, 12H), 0.99 (d, *J*=9.9 Hz, 4H), 1.33 (s, 12H), 1.77-1.91 (m, 4H), 2.45-2.53 (m, 8H), 2.65-2.73 (m, 8H), 7.29 (d, *J*=8.1 Hz, 4H), 7.99 (d, *J*=7.8 Hz, 4H), 7.76 (t, *J*=7.8 Hz, 2H), 7.85 (d, *J*=7.5 Hz, 4H), 8.07 (t, *J*=7.8 Hz, 4H), 8.18 (d, *J*=7.5 Hz, 4H), 8.25 (d, *J*=8.1 Hz, 4H); Anal. Calcd for $C_{82}H_{82}N_{10}Cu_2P_2F_{12} \cdot (CH_2Cl_2)_2$: C, 56.21; H, 4.84; N, 7.81. Found: C, 56.22; H, 4.92; N, 7.71%; ESI-MS m/z: 1479.7 (M^+-PF_6^-).

General procedure for catalytic asymmetric cyclopropanation

To a 25 mL pear shaped flask was charged catalyst (2.5 μmol) and dry dichloromethane (0.4 mL) under nitrogen atmosphere. A solution of alkene (5 mmol) and ethyl diazoacetate (1.25 mmol, 130μL) was added continuously at 25°C for 0.5 h by means of a syringe pump. After addition completed, a small sample of the crude product was analyzed by GC and the products were purified by flash column chromatography (petroleum ether:ethyl acetate = 30:1).