Enantioselective Copper-Catalyzed Diels–Alder Cycloaddition


Comment: Products were obtained in high yields and excellent enantioselectivities. This class of chiral Lewis acid catalysts has since been applied to asymmetric aldol reactions, Michael additions, and carbonyl ene reactions by the same group (J. S. Johnson, D. A. Evans Acc. Chem. Res. 2000, 33, 325).

Examples:

86% yield
endo/exo = 98:2
>98% ee (endo)

85% yield
endo/exo = 96:4
97% ee (endo)

85% yield
endo/exo = 90:10
90% ee (endo)

92% yield
endo/exo = 94:6
95% ee (endo)

82% yield
endo/exo = 96:4
94% ee (endo)

86% yield
endo/exo = 92:8
97% ee (endo)

88% yield
endo/exo = 84:16
96% ee (endo)

Double stereodifferentiating experiments:

>99:1 endo/endo

68:32 endo/endo