A Green Chemistry Approach to a More Efficient Asymmetric Catalyst:

Solvent-Free and Highly Concentrated Alkyl Additions to Ketones

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Conditions for the Determination of Enantiomeric Excesses.

The racemic alcohols were prepared by addition of organozinc reagent with racemic catalyst to the corresponding ketone, and then analyzed by chiral HPLC for determination of the enantioselectivity. Chiral HPLC analysis was performed using a Chiralcel OD-H or AD-H column.

2-(2,5-Dimethyl-thiophene-3-yl)-butan-2-ol (Table 2, entry 13).

Chiralcel AD-H, $t_1 = 60.5$ min, $t_2 = 66.0$ min at $\lambda = 254$ and 230 nm (hexanes only, 0.2 mL/min).

2-(*tert*-Butyl-diphenyl-silanyloxymethyl)-1-methyl-cyclohex-2-enol (Table 3, entry 7).

Chiralcel OD-H, $t_1 = 12.3$ min, $t_2 = 13.4$ min at $\lambda = 230$ and 210 nm (hexanes / 2-propanol : 95 / 5, 0.3 mL/min).

2-(2,5-Dimethyl-thiophen-3-yl)-butan-2-ol

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2-(*tert*-Butyl-diphenyl-silanyloxymethyl)-1-methyl-cyclohex-2-enol

2-(*tert*-Butyl-diphenyl-silanyloxymethyl)-1-methyl-cyclohex-2-enol

1-(*tert*-Butyl-dimethyl-silanyloxymethyl)-2-methyl-7-oxa-bicyclo[4.1.0]heptan-2-ol

1-(*tert*-Butyl-dimethyl-silanyloxymethyl)-2-methyl-7-oxa-bicyclo[4.1.0]heptan-2-ol