

SYNTHETIC EFFICIENCY

SELECTIVITY

CHEMO--

DIASTereo--

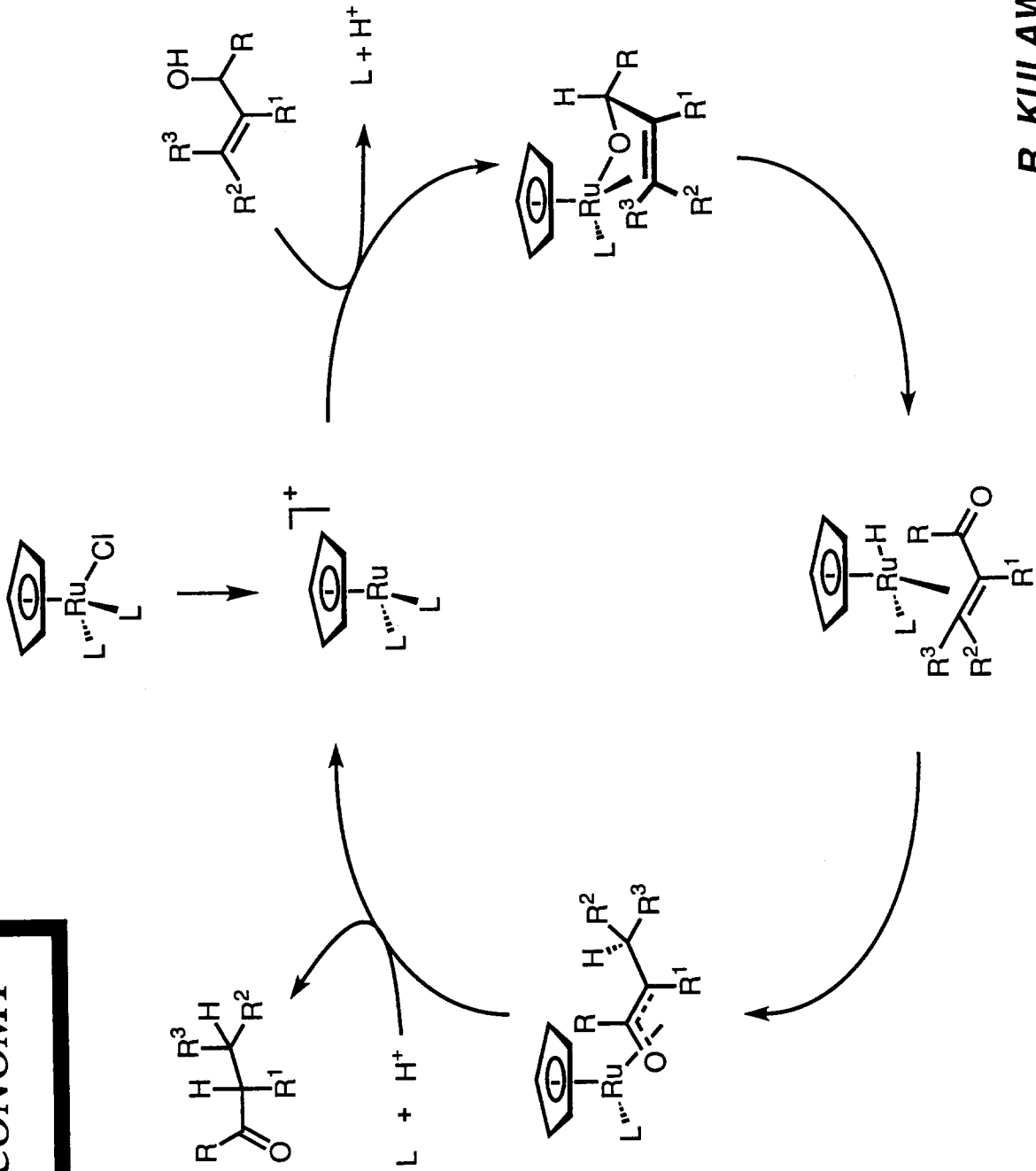
REGIO--

ENANTIO--

ATOM ECONOMY

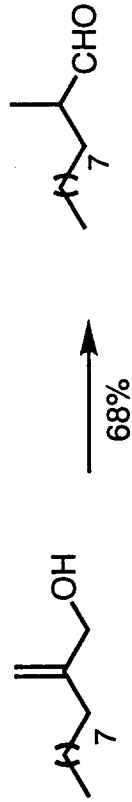
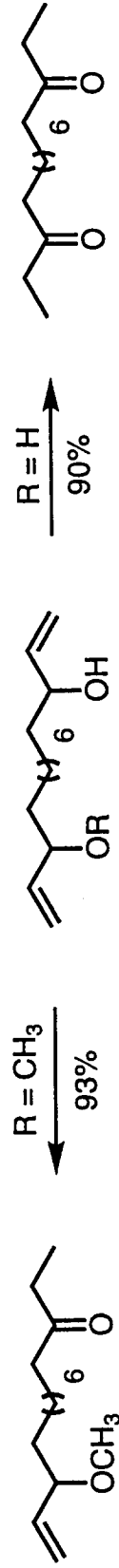
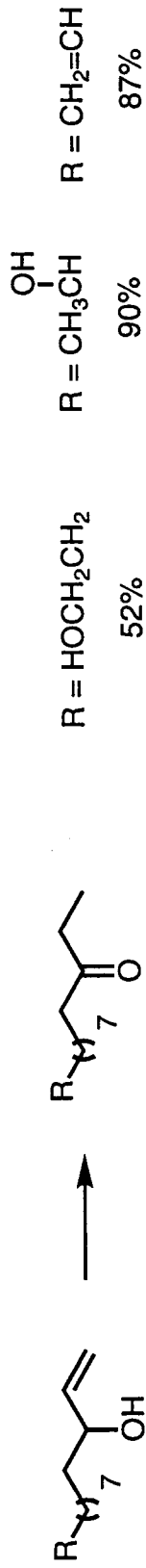
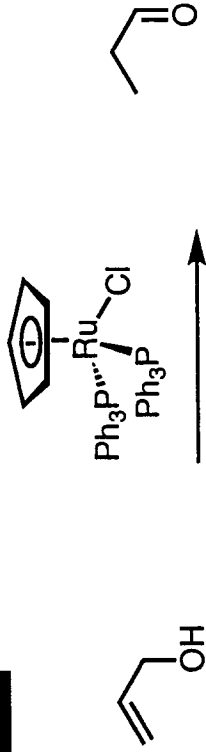
"ENVIRONMENTALLY BENIGN BY DESIGN"

ATOM ECONOMY



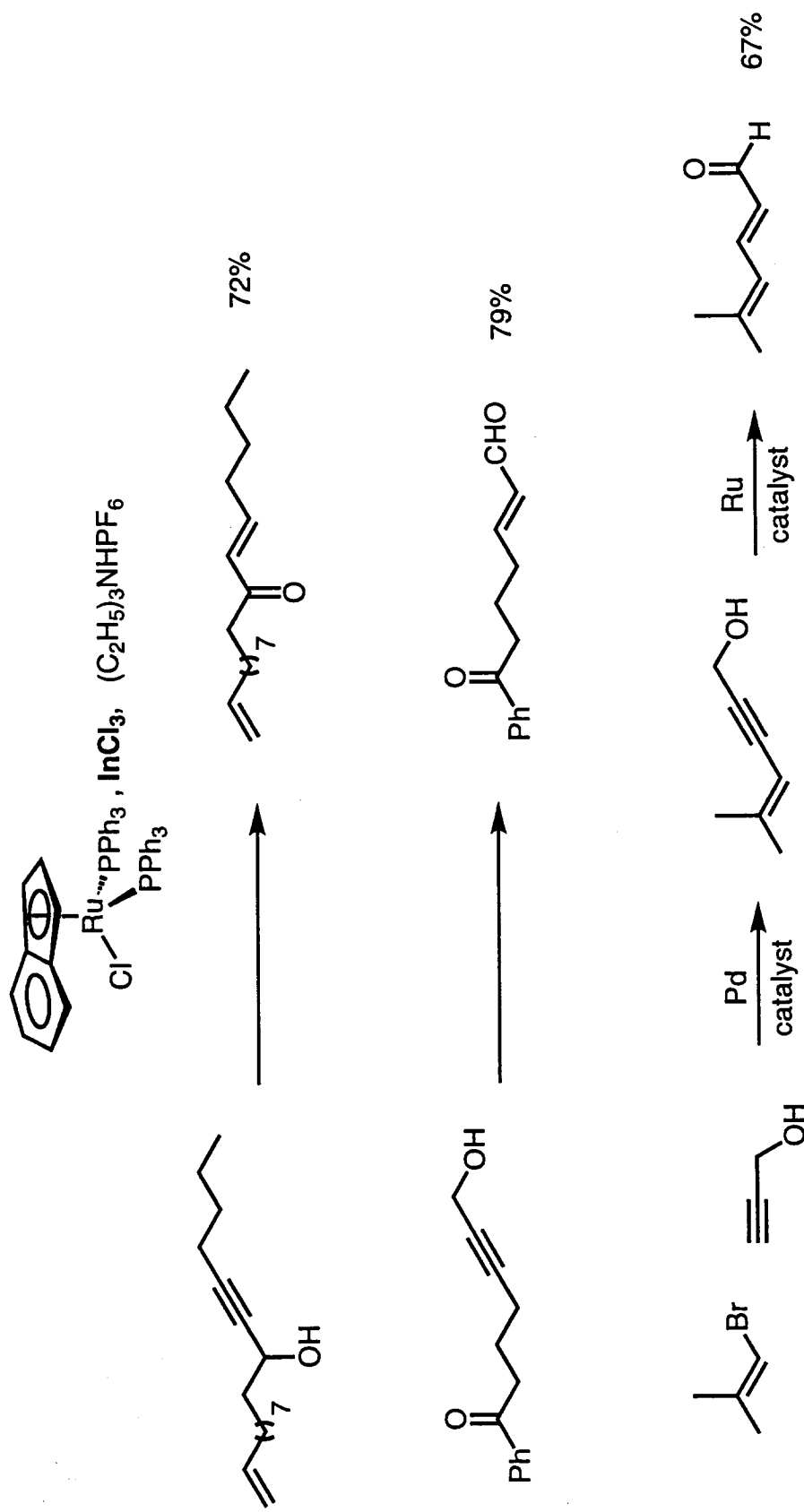
R. KULAWIEC

ATOM ECONOMY



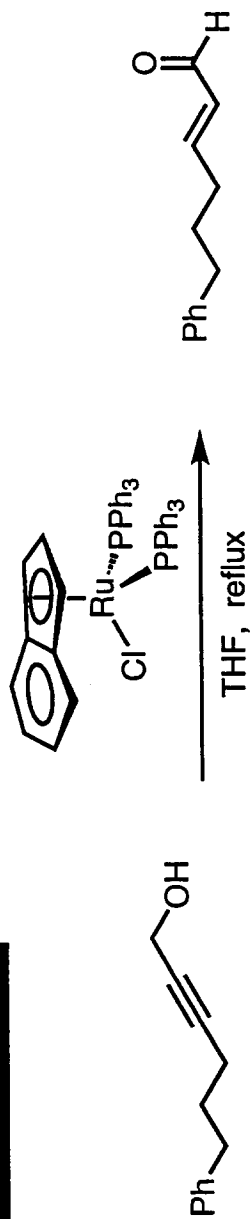
R. KULAWIEC

ATOM ECONOMY



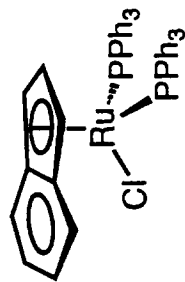
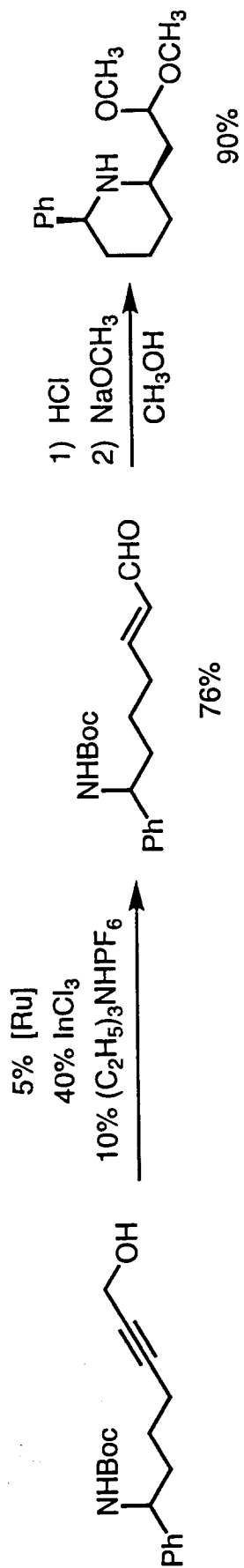
R.C. Livingston

ATOM ECONOMY



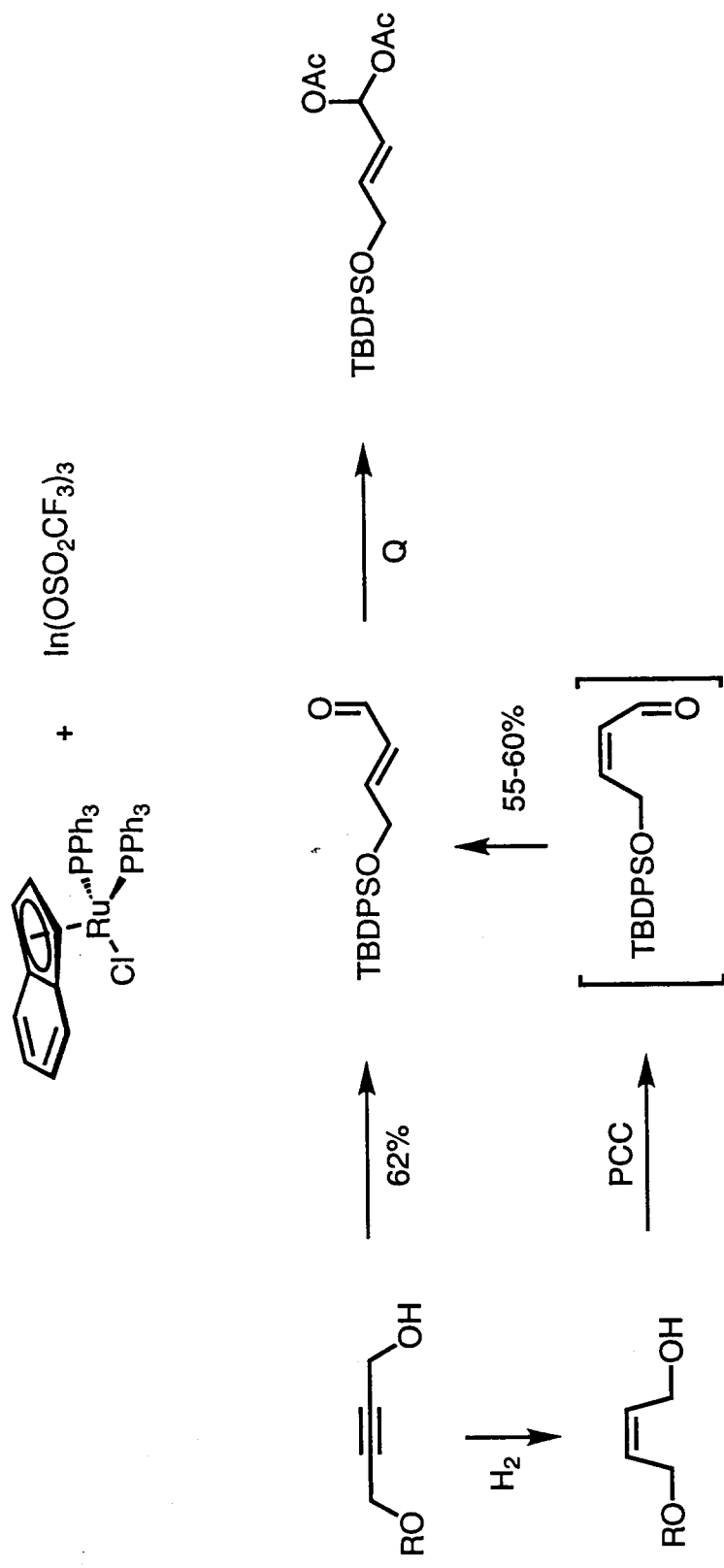
5% [Ru], 15% InCl ₃ , 10% (C ₂ H ₅) ₃ NHPPF ₆	2.5 hours	78%
5% [Ru], 40% InCl ₃ , 10% (C ₂ H ₅) ₃ NHPPF ₆	1.25 hours	88%
10% [Ru], 10% AgOSO ₂ CF ₃ , 20% TsOH	2.0 hours	CAPRICIOUS [RT]*
3% [Ru], 3% In(OSO ₂ CF ₃) ₃ , 5% CSA	0.5 hours	86%
2% [Ru], 2% In(OSO ₂ CF ₃) ₃ , 5% CSA	1.0 hours	84%
1% [Ru], 1% In(OSO₂CF₃)₃, 5% CSA	2.0 hours	83%

ATOM ECONOMY



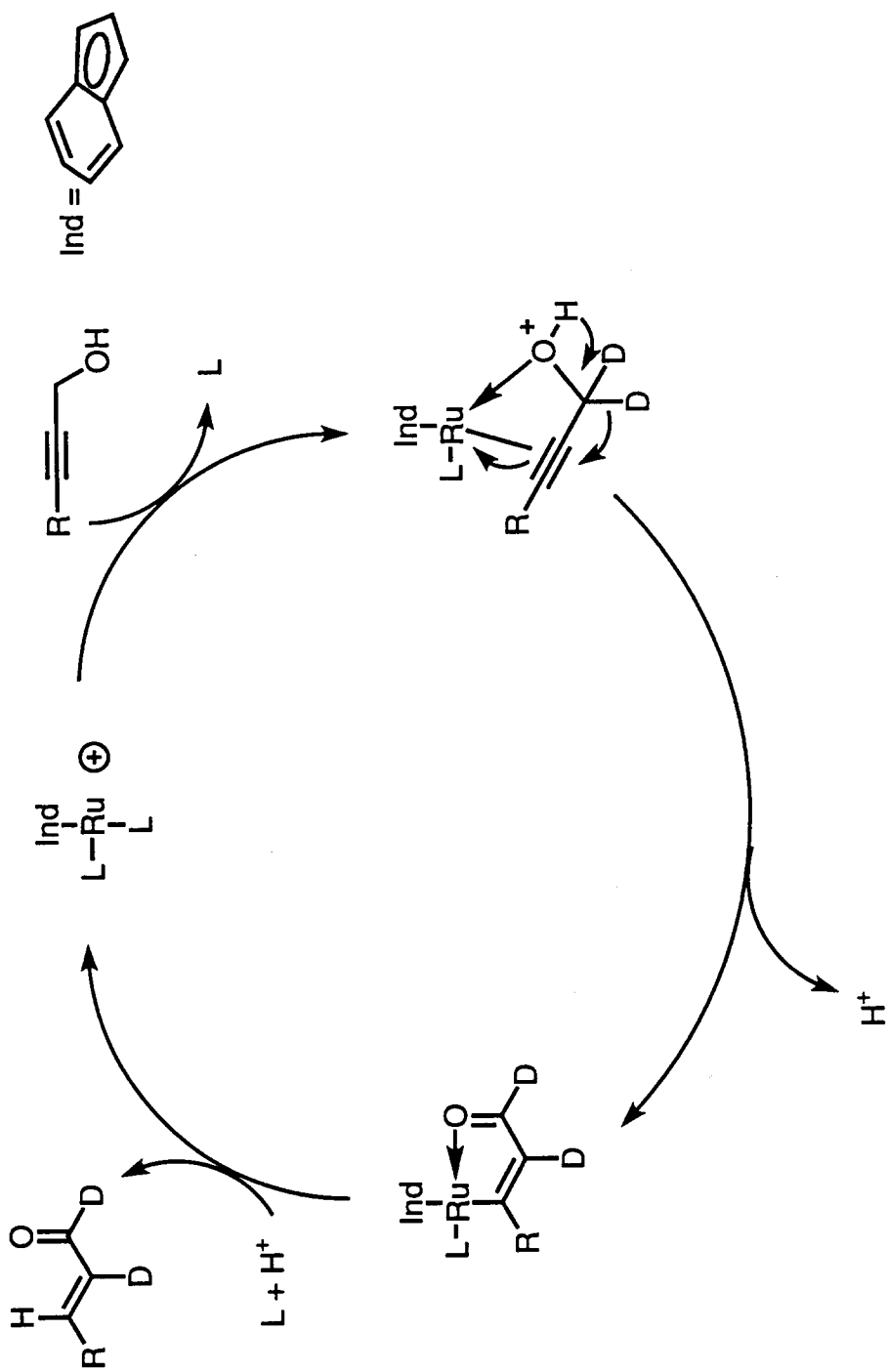
R.C. Livingston

ATOM ECONOMY

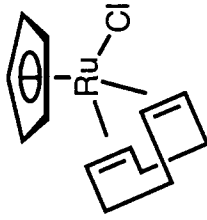


**R. LIVINGSTON
C.-B. LEE**

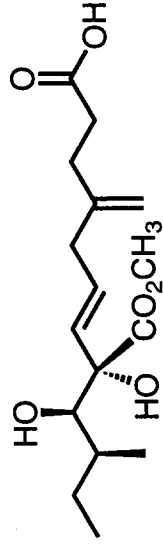
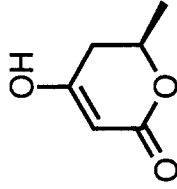
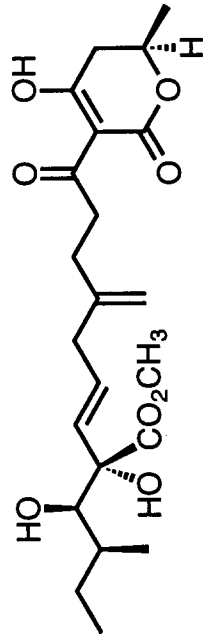
ATOM ECONOMY



ATOM ECONOMY



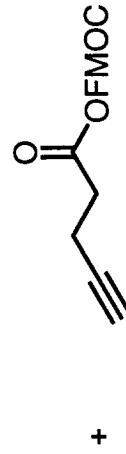
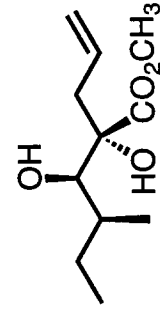
Cf. lit. A. Ichihara et al.,
J. Org. Chem. **1994**, *59*, 4749.



R = H

R = FMOC

ALTERNARIC ACID



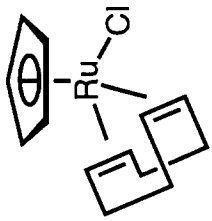
92%

1 atm 8:1

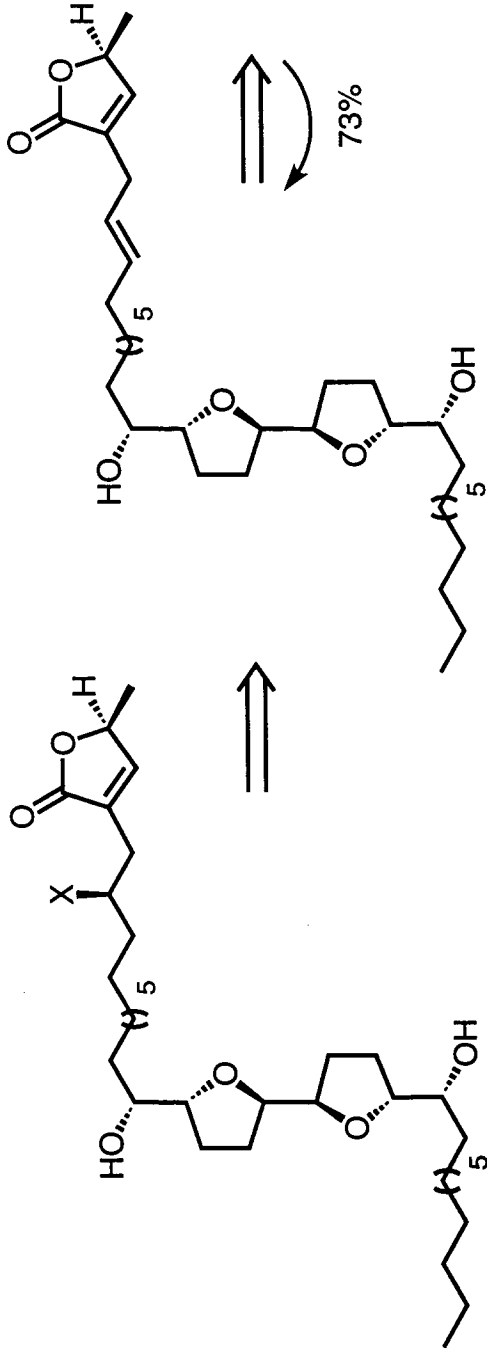
7 kbar 19:1

G. PROBST

ATOM ECONOMY



$\text{In}(\text{OSO}_2\text{CF}_3)_3$

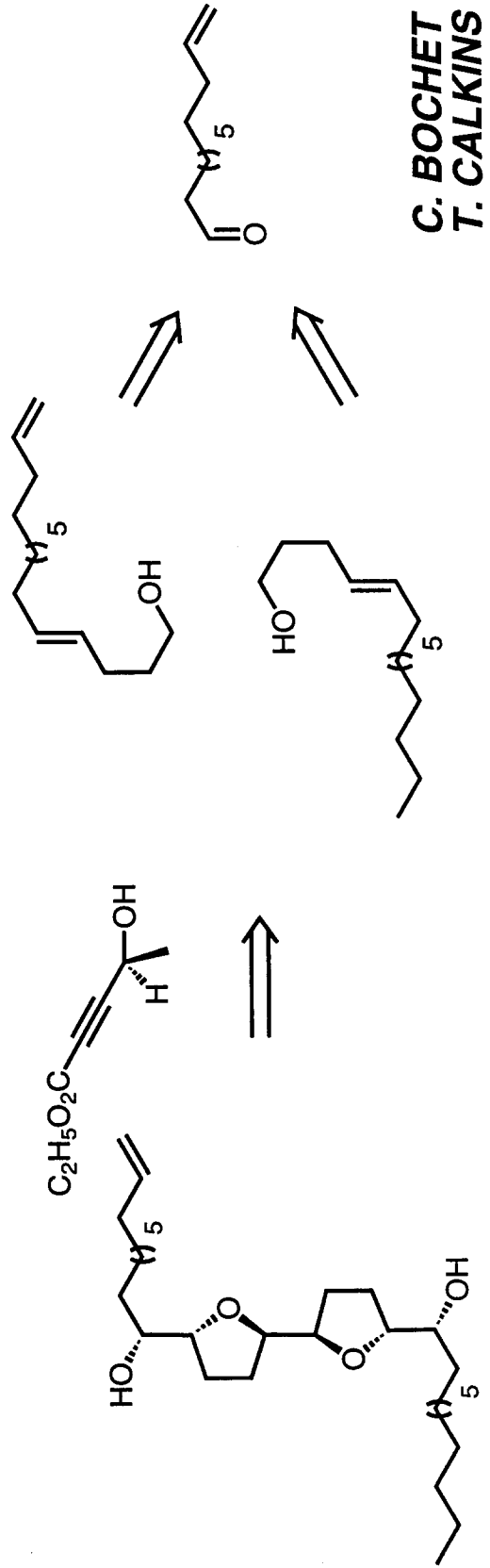


X = H SQUAMOCIN K

OH SQUAMOCIN E

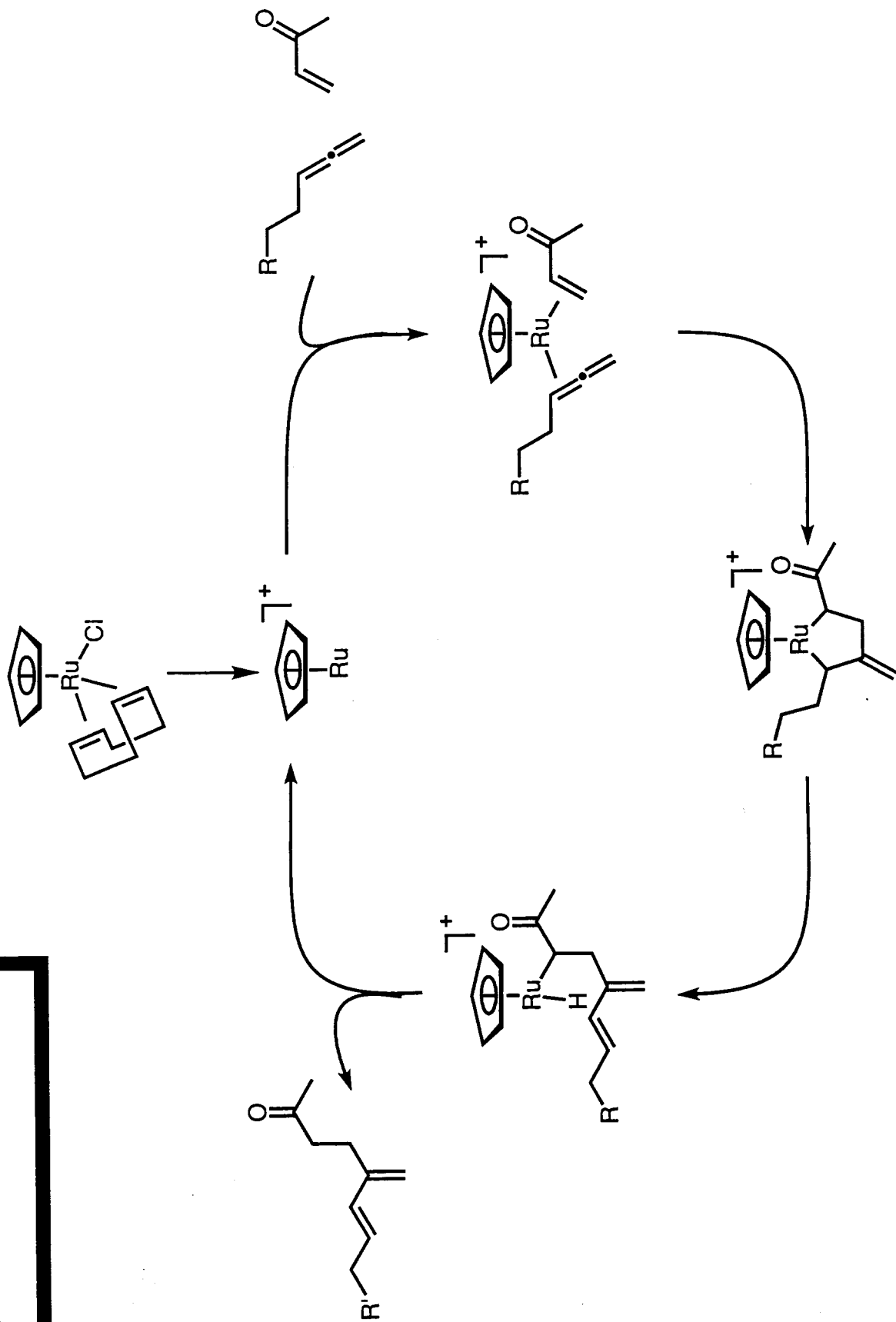
|||

PARVIFLORIN

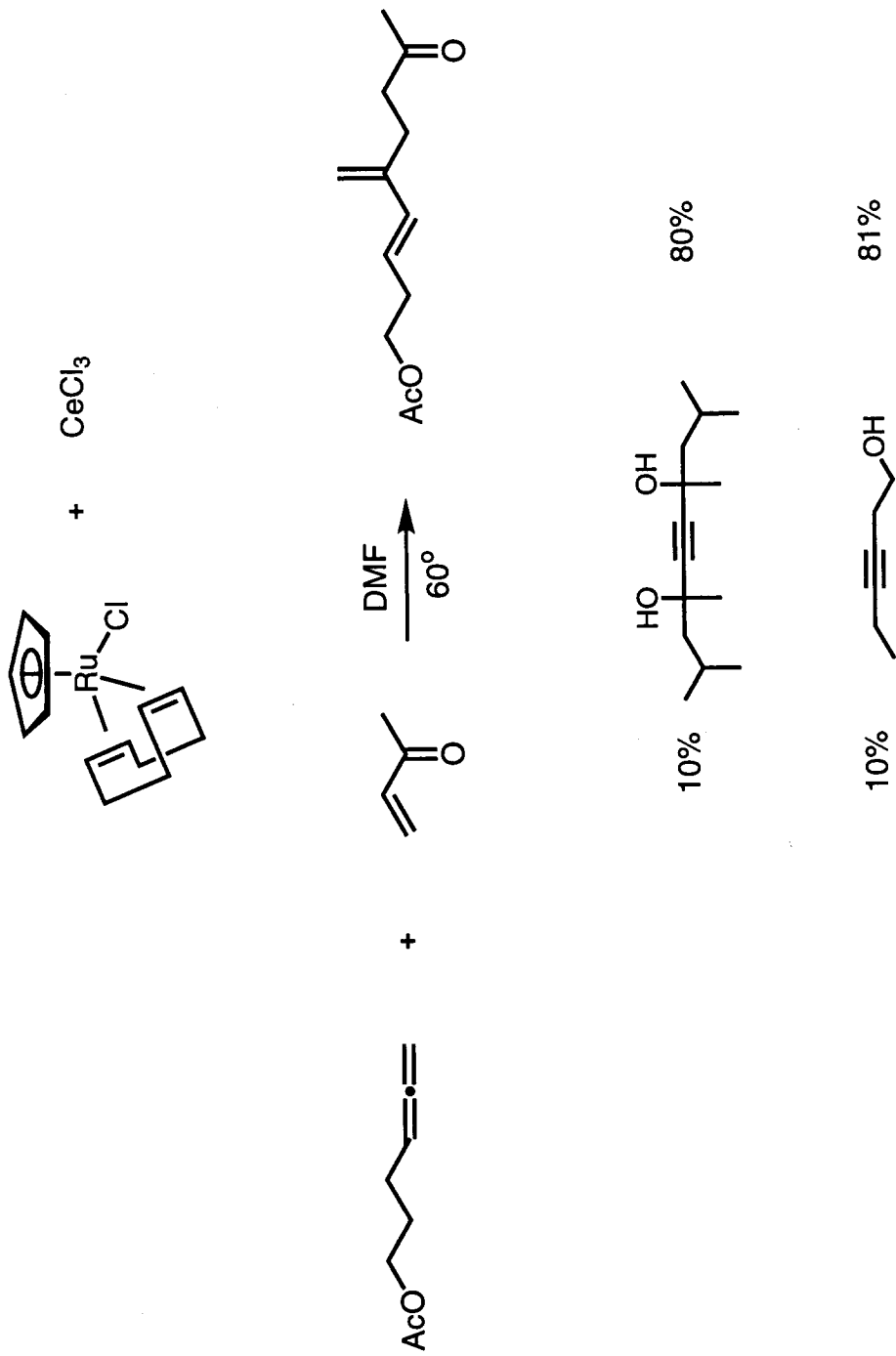


C. BOCHET
T. CALKINS

ATOM ECONOMY

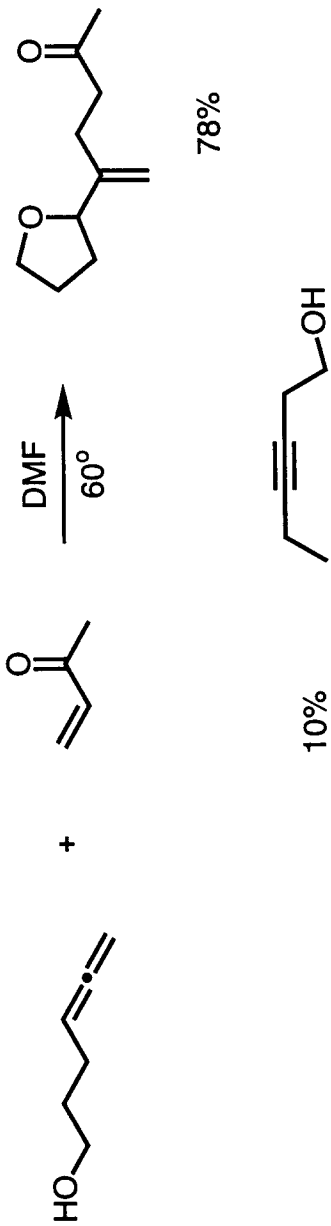
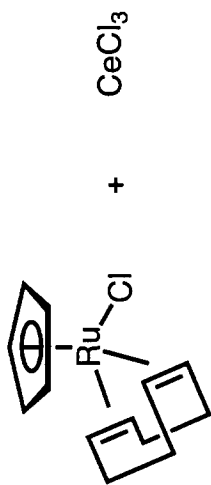


ATOM ECONOMY



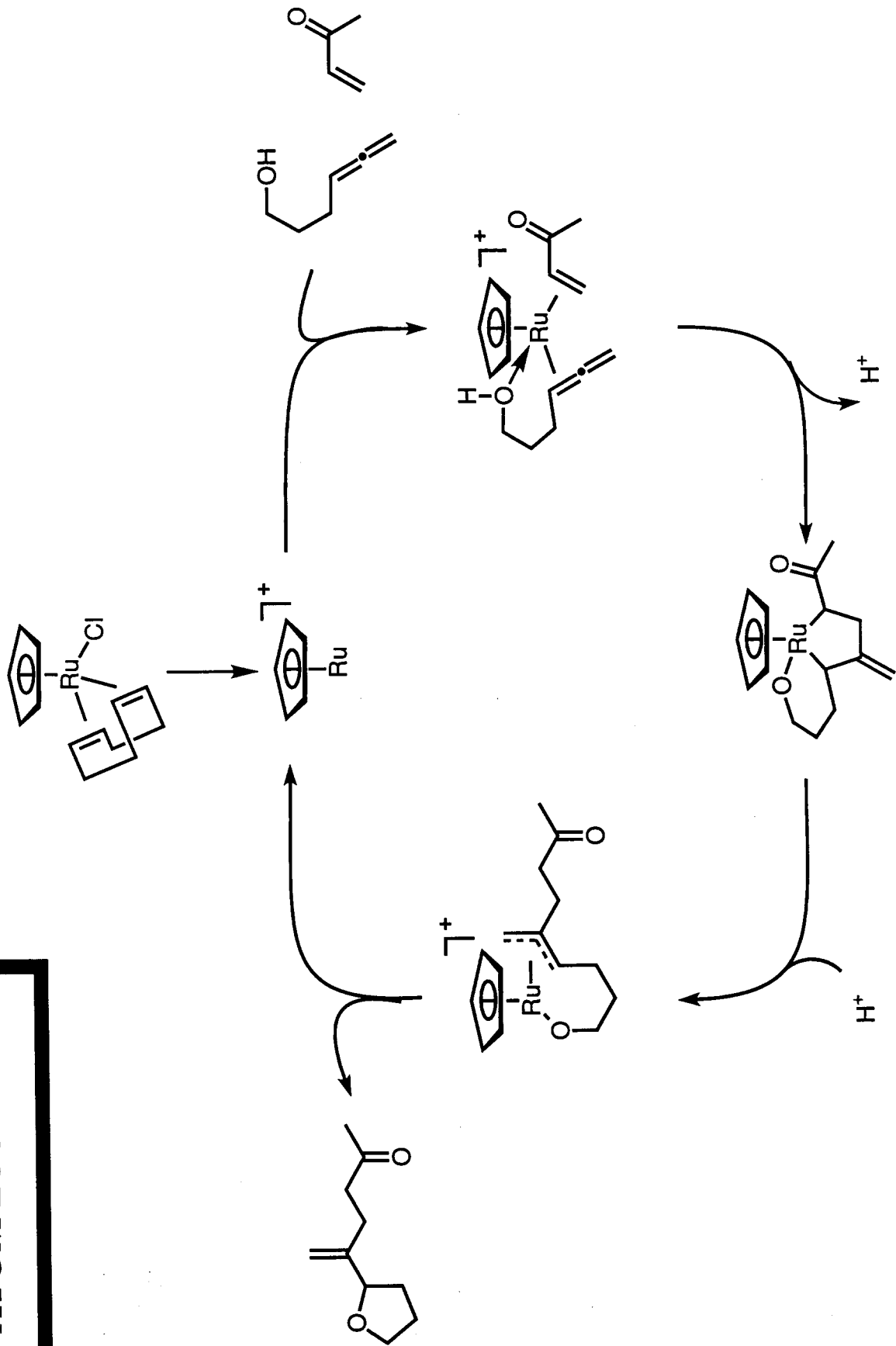
A. PINKERTON

ATOM ECONOMY

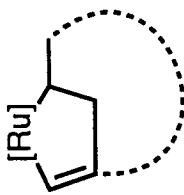
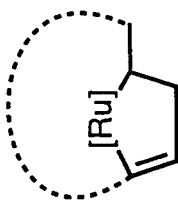
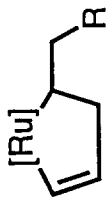


A. PINKERTON

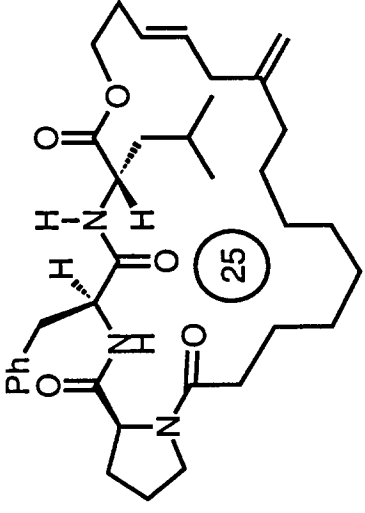
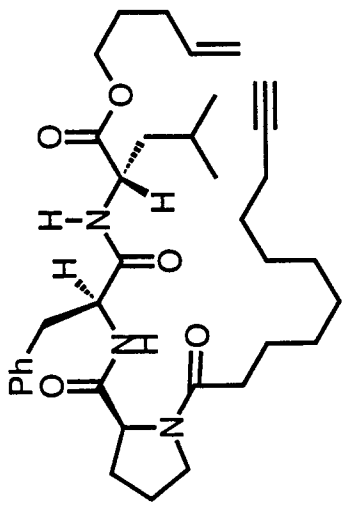
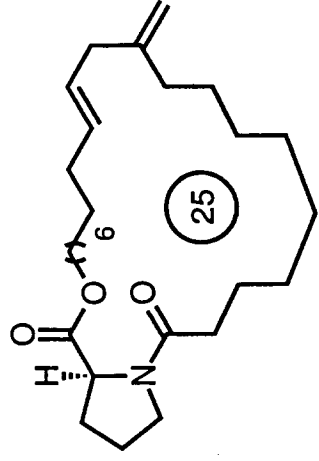
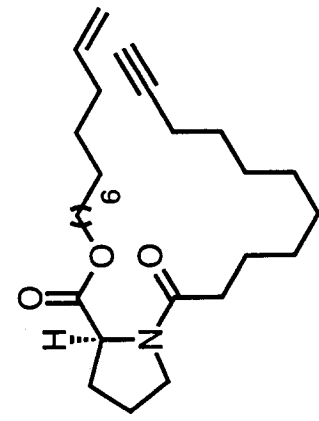
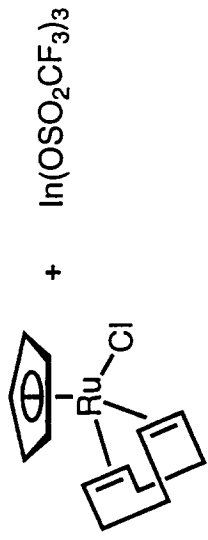
ATOM ECONOMY



ATOM ECONOMY

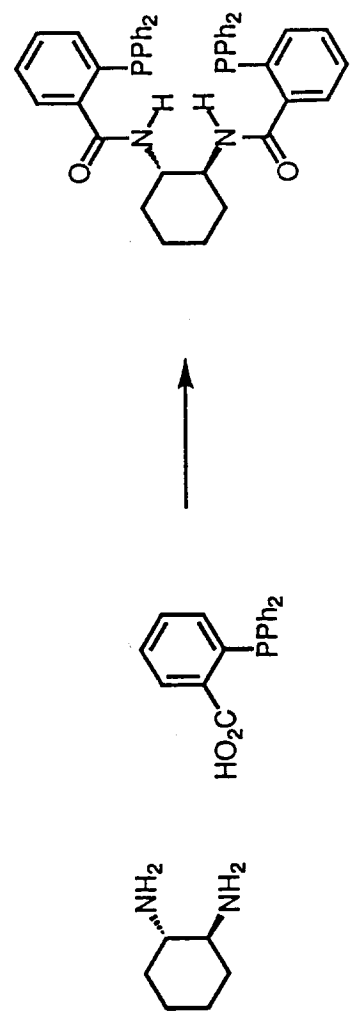
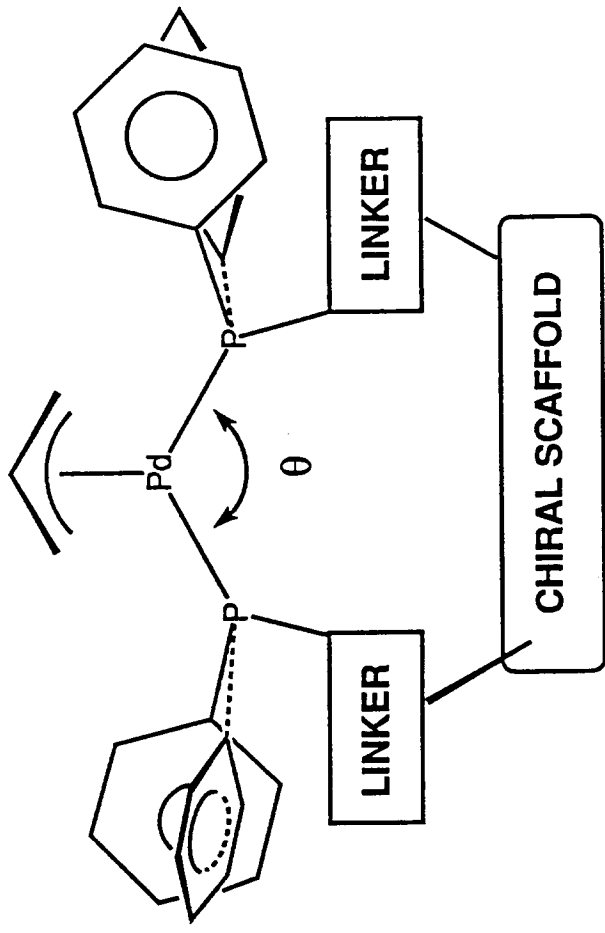


CHEMOSELECTIVITY

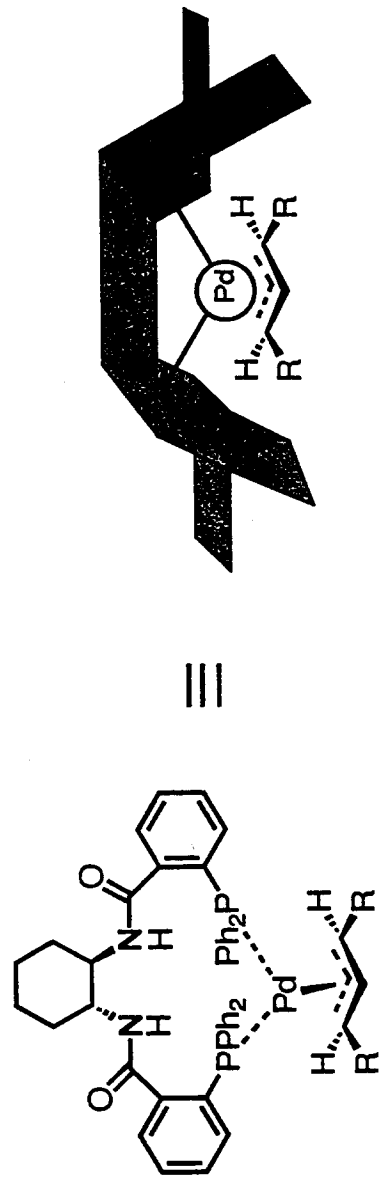
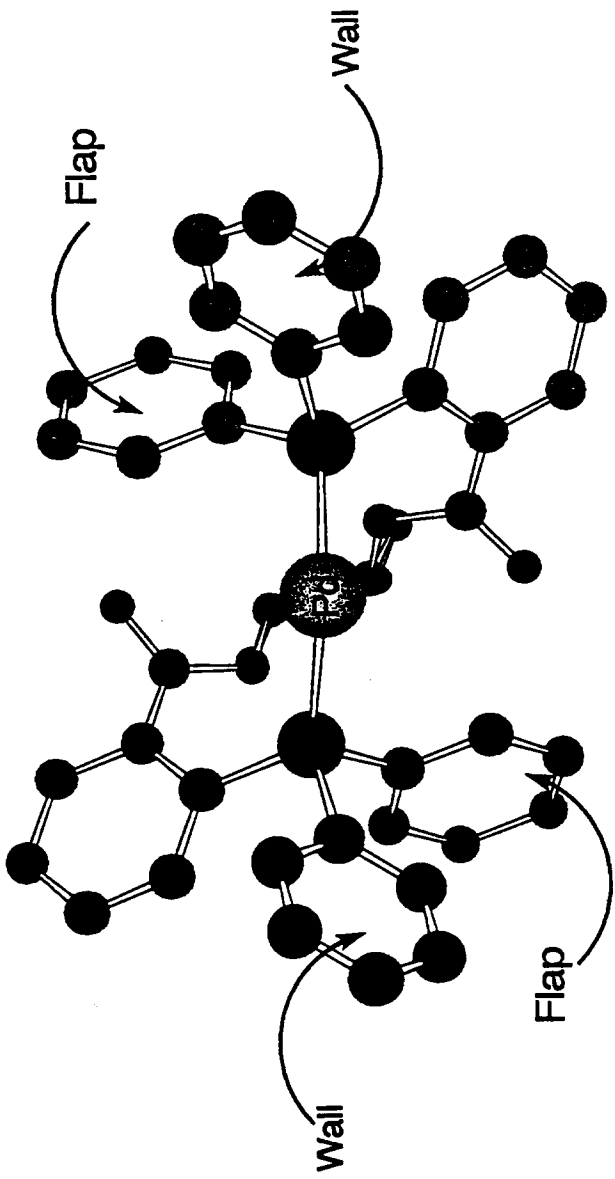


M. SUNDERMANN

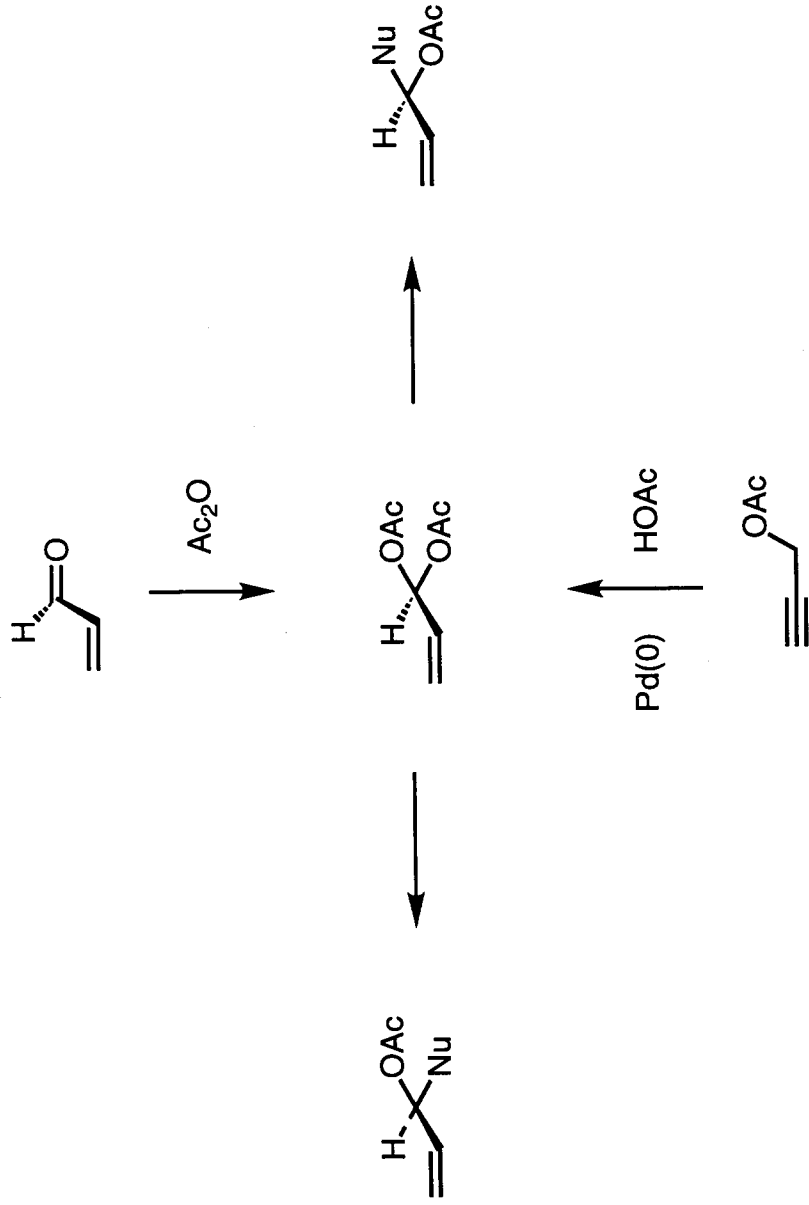
ENANTIOSELECTIVITY



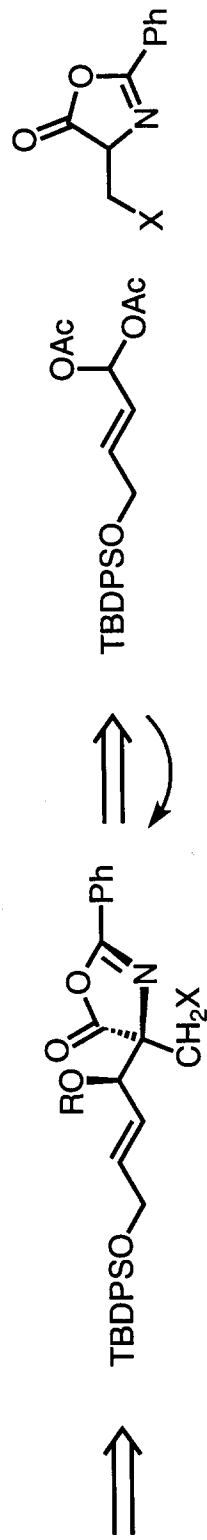
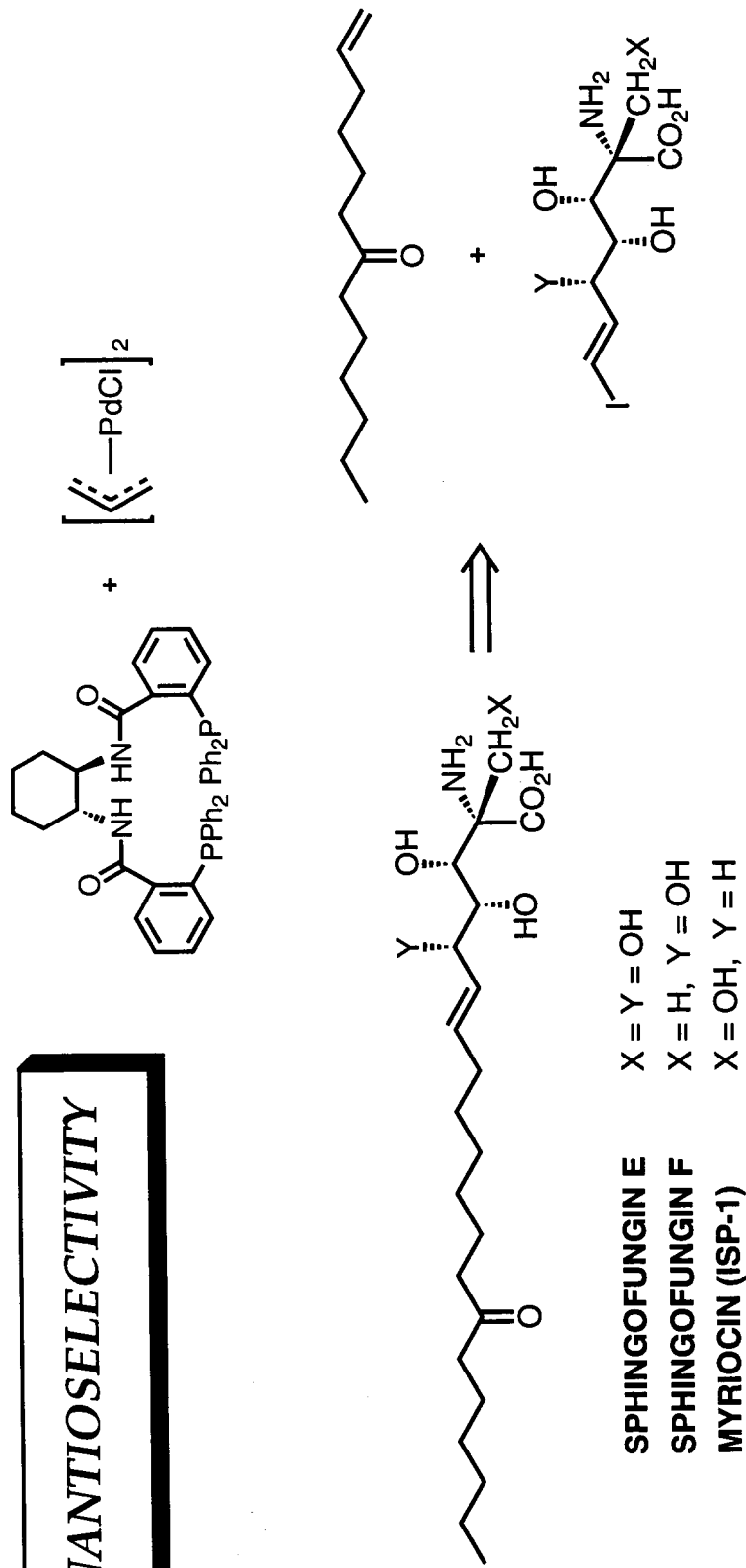
ENANTIOSELECTIVITY



ENANTIOSELECTIVITY



ENANTIOSELECTIVITY

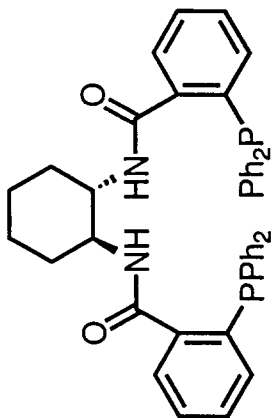


$\text{X} = \text{H}$ 70% yield 89% ee

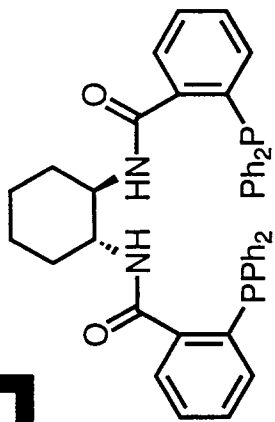
$\text{Si}(\text{CH}_3)_2\text{Ph}$ 68% yield 96% ee

C.B. LEE

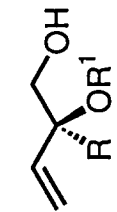
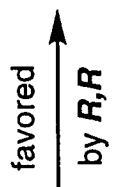
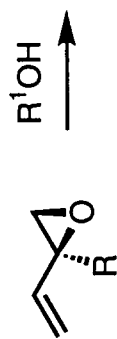
ENANTIOSELECTIVITY



S,S

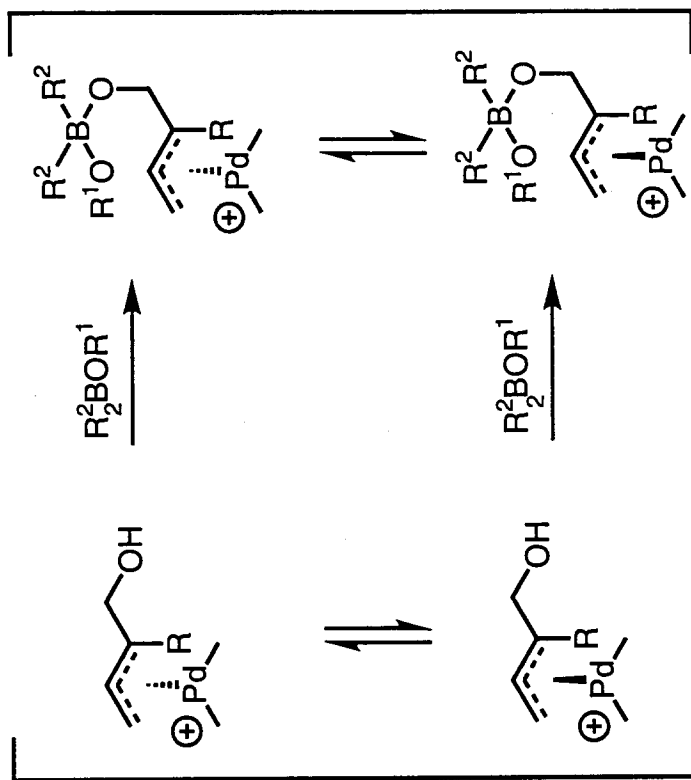


R,R



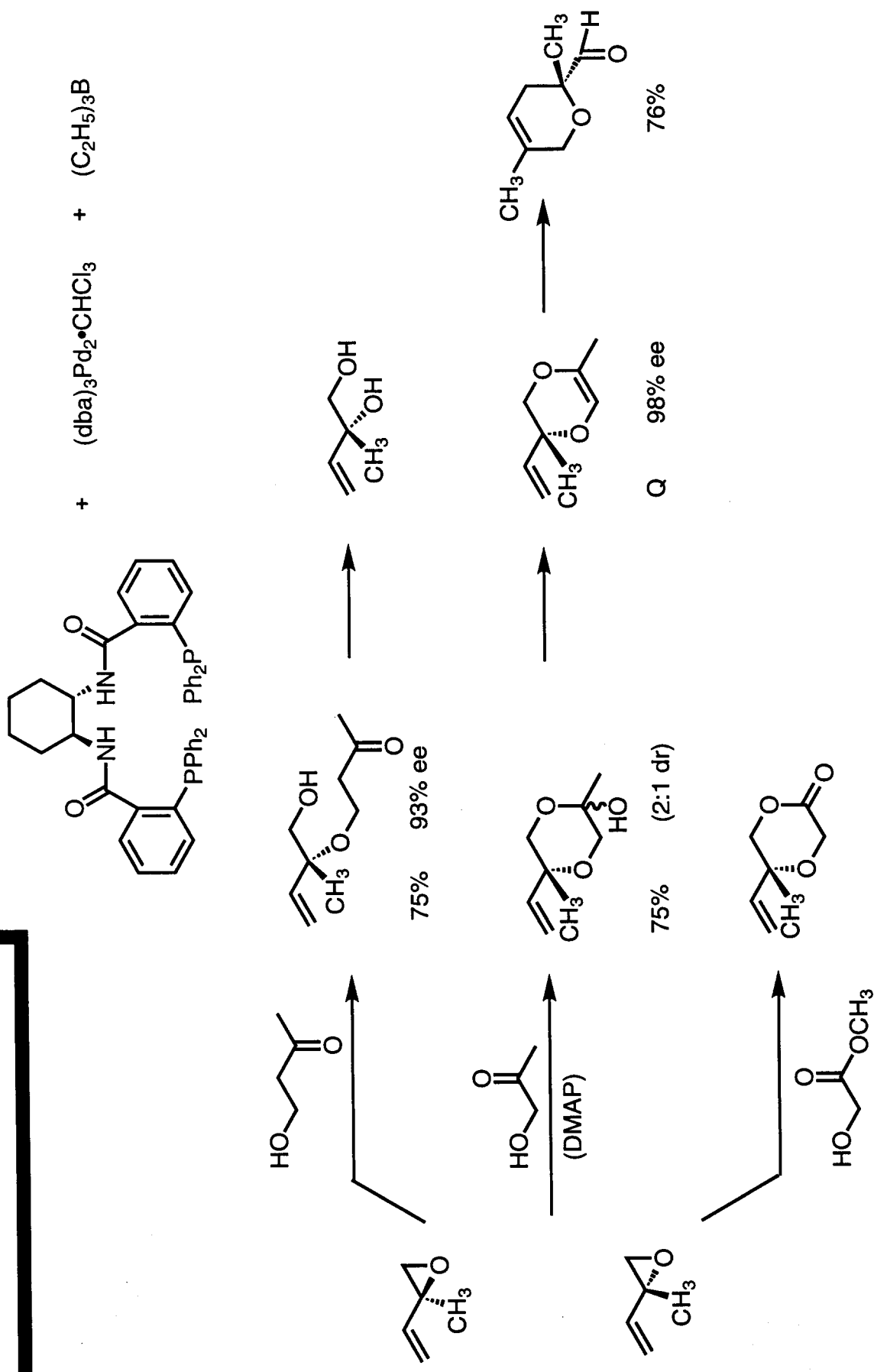
avored
by *R,R*

avored
by *S,S*



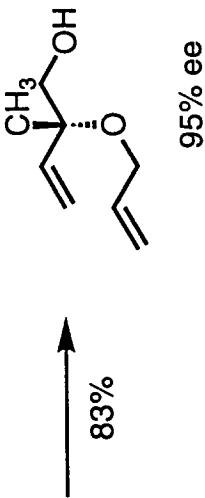
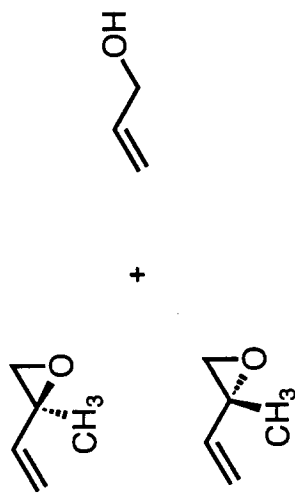
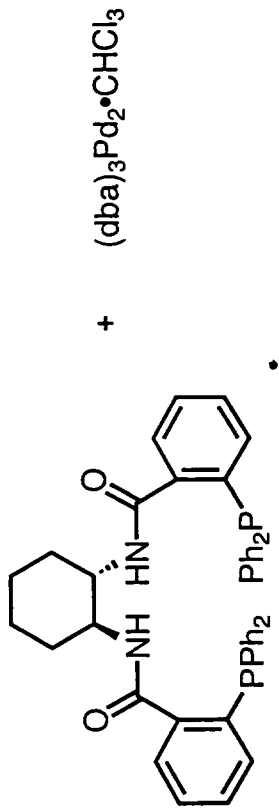
E. McEACHERN

ENANTIOSELECTIVITY



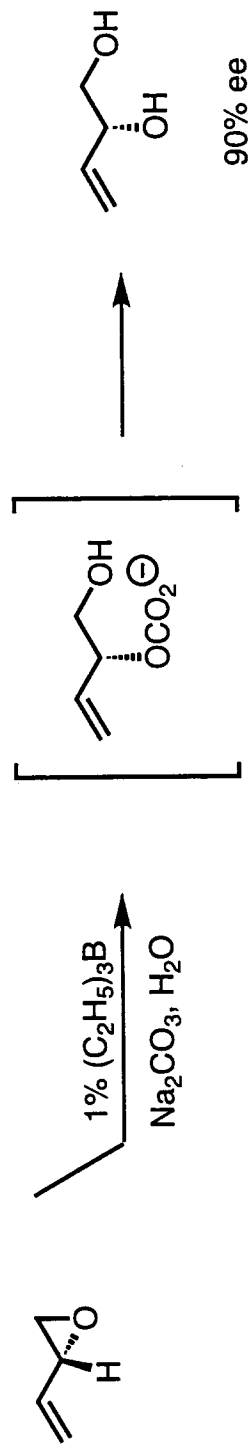
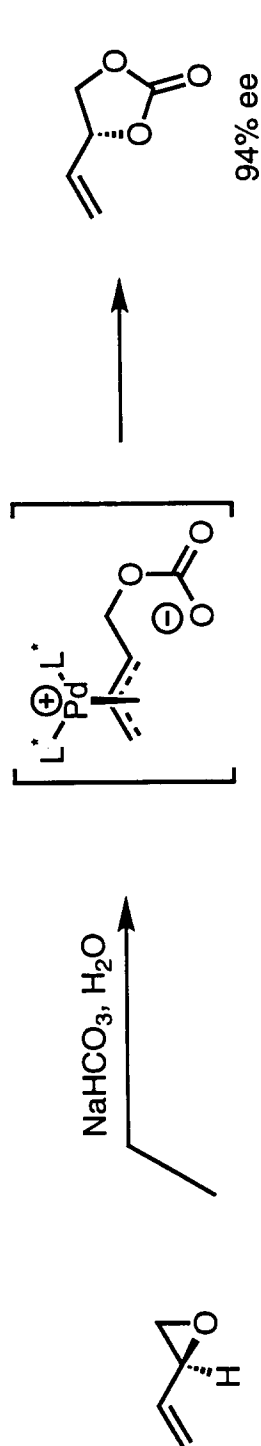
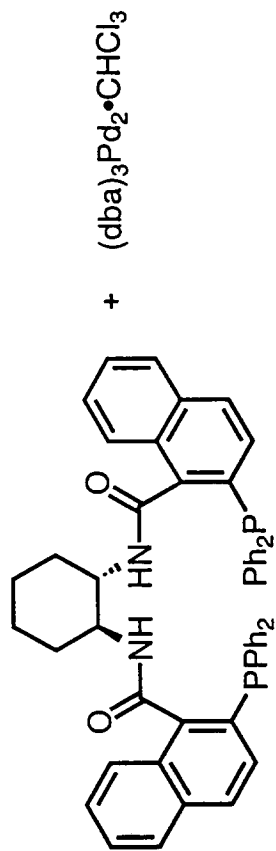
E. McEACHERN

ENANTIOSELECTIVITY



E. MCEACHERN

ENANTIOSELECTIVITY



E. McEACHERN

ENANTIOSELECTIVITY

