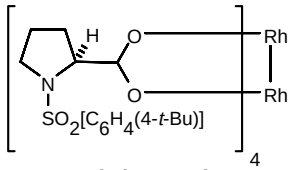
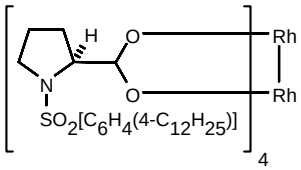
# Asymmetric Vinylcarbenoid & Phenylcarbenoid Cyclopropanations




**$Rh_2$(*S*-TBSP)$_4$**




**$Rh_2$(*S*-DOSP)$_4$**

Davies and co-workers have demonstrated the broad utility of chiral dirhodium tetracarboxylates[1] such as $Rh_2$(S-TBSP)$_4$ and $Rh_2$(S-DOSP)$_4$ as catalysts for asymmetric cyclopropanations by either vinyldiazoacetates[2] or phenyldiazoacetate derivatives.[3] A remarkable feature of these transformations is that the cyclopropanations occur with high diastereoselectivity and enantioselectivity. These transformations can be used in general methods for the asymmetric synthesis of vinylcyclopropanes,[2] cyclopropaneamino acids,[2] 4,4-diarylbutanoates,[4] cycloheptadienes, bicyclo[3.2.1]octadienes,[5] and other polycyclic compounds.[6] Several applications of $Rh_2$(S-TBSP)$_4$ and $Rh_2$(S-DOSP)$_4$ are illustrated on the right.


**References:** (1) For earlier examples of the use of rhodium prolinates in asymmetric carbenoid transformations, see: Ye, T.; García, C.F.; McKervey, M.A. *J. Chem. Soc., Perkin Trans. 1* **1995**, 1373, and references cited therein. (2)(a) Davies, H.M.L.; Hutcheson, D.K. *Tetrahedron Lett.* **1993**, *34*, 7243. (b) Davies, H.M.L.; Bruzinski, P.R.; Lake, D.H.; Kong, N.; Fall, M.J. *J. Am. Chem. Soc.* **1996**, *118*, 6897. (3)(a) Davies, H.M.L.; Bruzinski, P.R.; Fall, M.J. *Tetrahedron Lett.* **1996**, *37*, 4133. (b) Doyle, M.P.; Zhou, Q.-L.; Charnsangavej, C.; Longoria, M.A.; McKervey, M.A.; Garcia, C.F. *ibid.* **1996**, *37*, 4129. (4) Corey, E.J.; Gant, T.G. *ibid.* **1994**, *35*, 5373. (5) Davies, H.M.L.; Peng, Z.-Q.; Houser, J.H. *ibid.* **1994**, *35*, 8939. (6) Davies, H.M.L.; Doan, B.D. *ibid.* **1996**, *37*, 3967. (7) Davies, H.M.L.; Hansen, T.; Rutberg, J.; Bruzinski, P.R. *ibid.* **1997**, *38*, 1741.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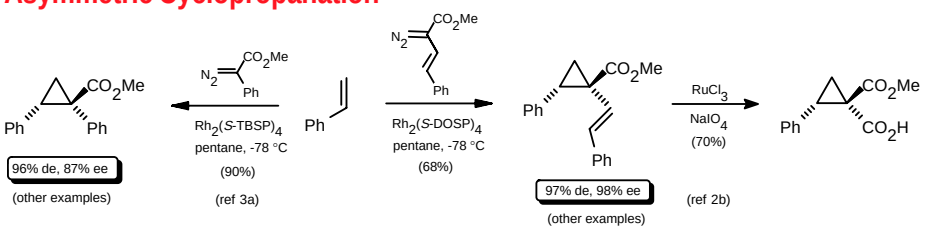
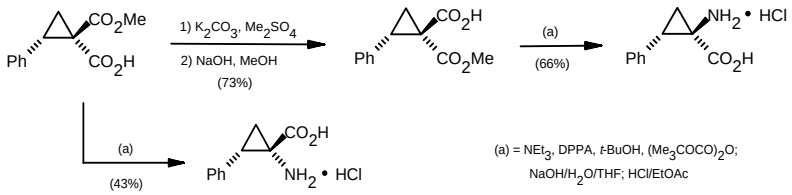
|---|---|---|---|
| *NEW!* | 47,044-9 | $Rh_2$(*S*-DOSP)$_4$ | 100mg; 250mg |
| *NEW!* | 47,114-3 | $Rh_2$(*R*-DOSP)$_4$ | 100mg; 250mg |
| *NEW!* | 47,461-4 | $Rh_2$(*S*-TBSP)$_4$ | 100mg; 250mg |
| *NEW!* | 47,462-2 | $Rh_2$(*R*-TBSP)$_4$ | 100mg; 250mg |

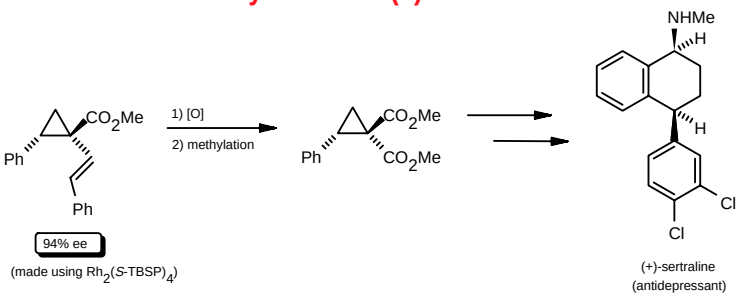
## Asymmetric Cyclopropanation[2b,3a]



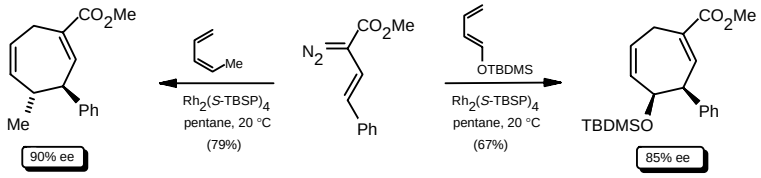

## Synthesis of Cyclopropane Amino Acids[2b]



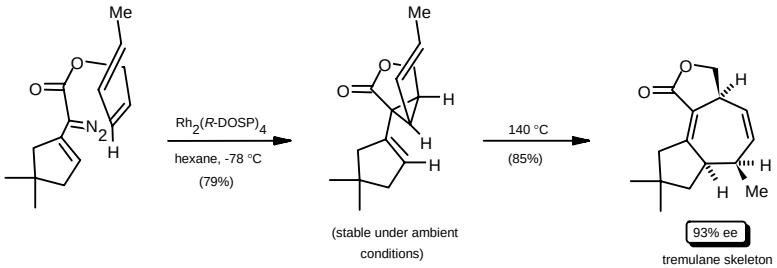

## Catalytic Enantioselective Synthesis of (+)-Sertraline[4]




## Asymmetric Tandem Cyclopropanation/Cope Rearrangement[5]




## Asymmetric Intramolecular Tandem Cyclopropanation/Cope Rearrangement[6]




## Asymmetric Si-H Insertion[7]