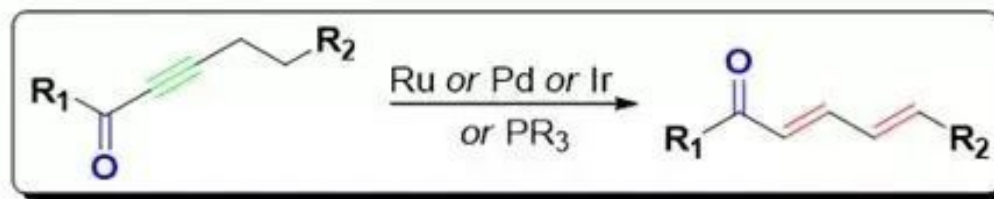


# Lu-Trost-Inoue Reaction

# Lu-Trost-Inoue Reaction



D. Ma, X. Lu 1988



B. M. Trost 1988



Y. Inoue 1988

Ma, D.; Lin, Y.; Lu, X.\*; Yu, Y. *Tetrahedron Lett.* **1988**, 29, 1045-1048.

Trost, B. M.\*; Schmidt, T. J. *Am. Chem. Soc.* **1988**, 110, 2301-2303.

Inoue, Y.\*; Imaizumi, S. J. *Mol. Catal.* **1988**, 49, L19-L21.

# Lu-Trost-Inoue Reaction



**Born at 1928**

**1951 B.Sc. from Zhejiang University**

**1951-present Shanghai Institute of Organic Chemistry**

**1991 Member of Chinese Academy of Science**

**Lu's [3+2] annulation    Lu-Trost-Inoue**



**Undergraduate - B.A. University of Pennsylvania, 1962**

**Ph.D. Massachusetts Institute of Technology, 1965**

**Professor of Chemistry, Stanford University, 1987.**

**Trost不对称烯丙位烷化反应**

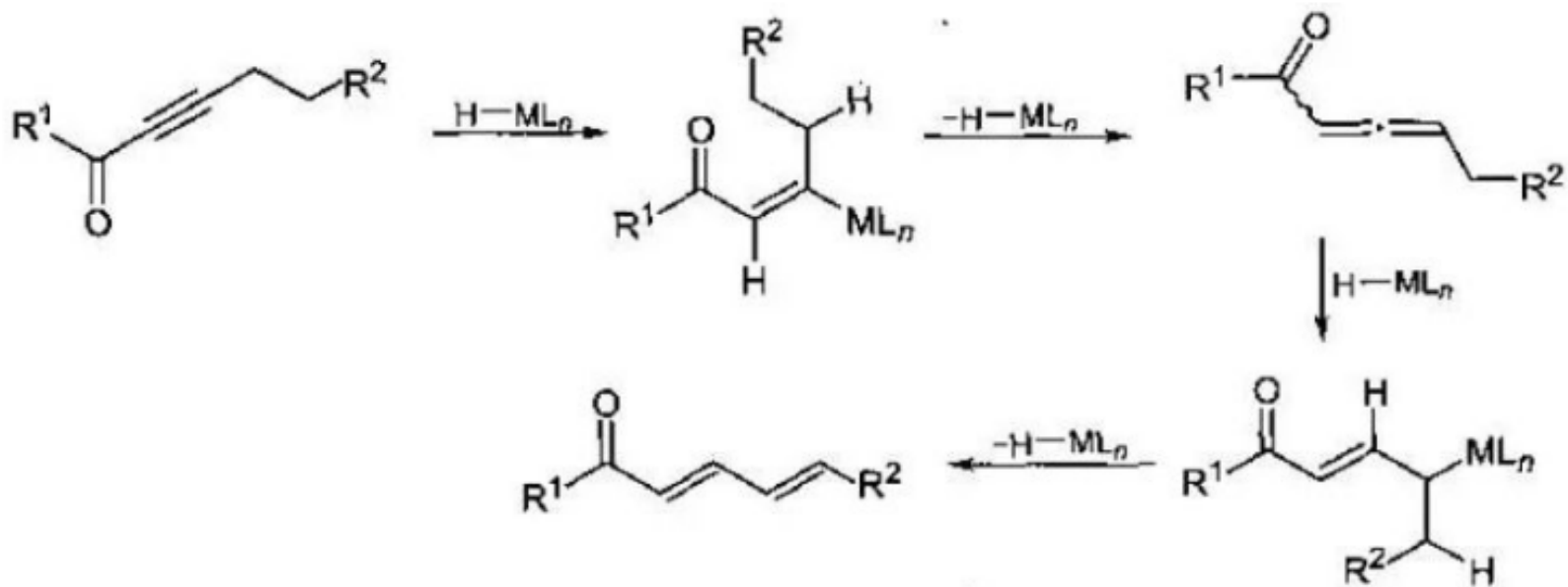
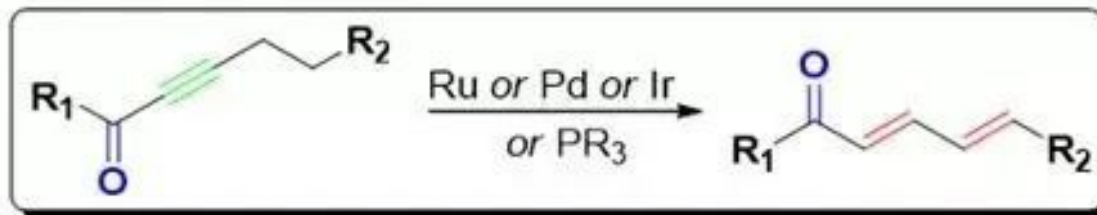
**Trost环戊烷合成**

**Trost氧化脱羧反应**

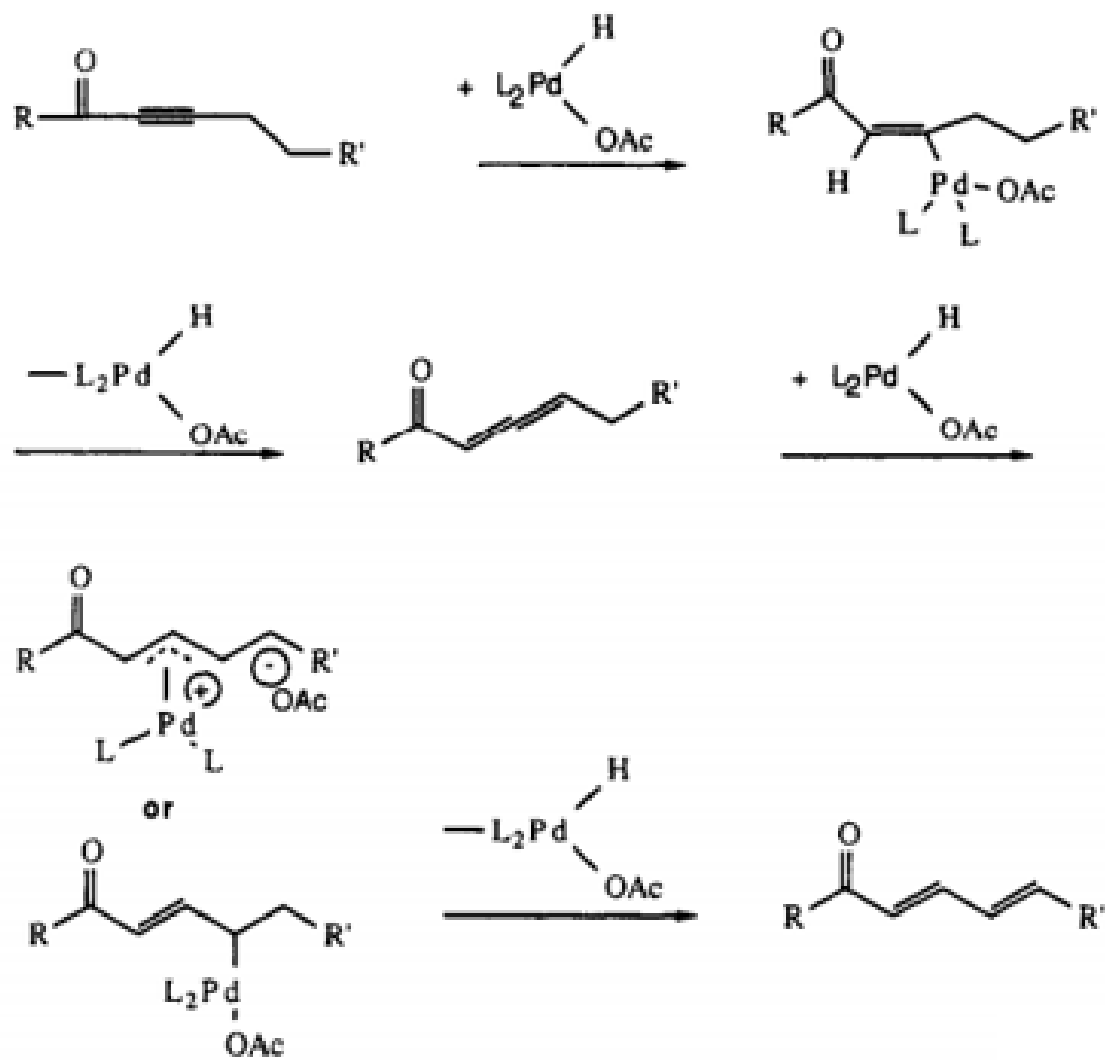
**Trost-Chen脱羧反应**

**Tsuji-Trost反应**

# MH mechanism of Lu-Trost-Inoue reaction

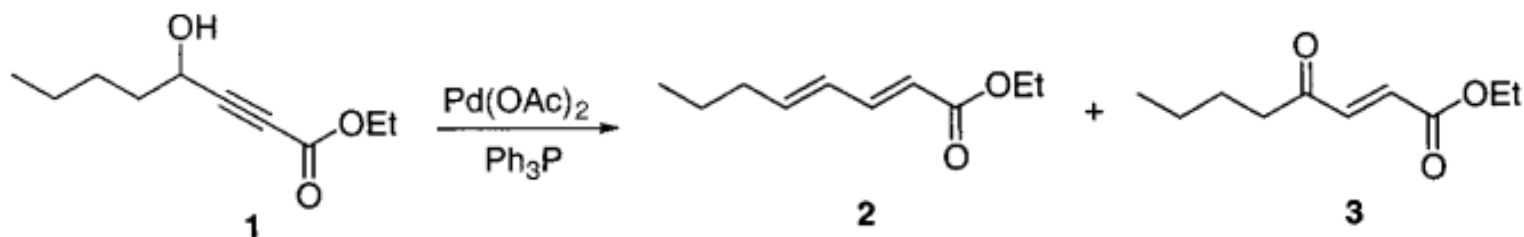


# PdH mechanism of Lu-Trost-Inoue reaction

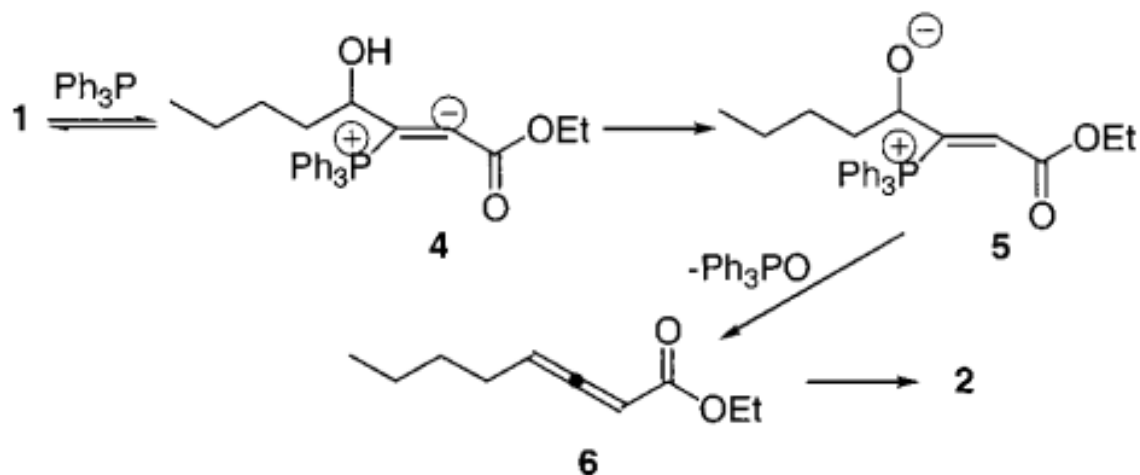


Trost, B. M.\*; Schmidt, T. J. Am. Chem. Soc. **1988**, 110, 2301-2303.

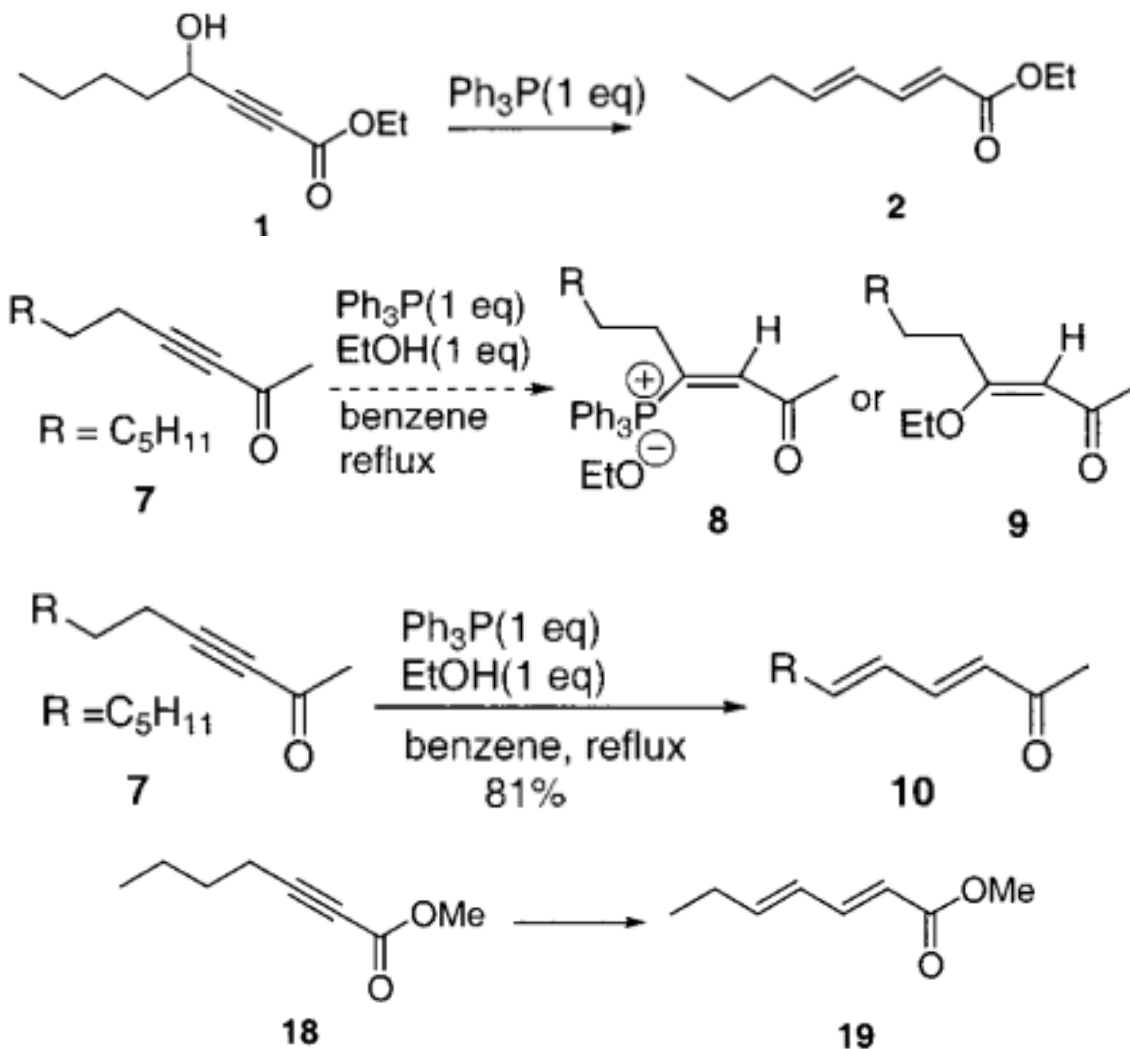
# PR<sub>3</sub> Induced Isomerization



$\text{Pd}(\text{OAc})_2$ (mol%)	$\text{Ph}_3\text{P}$ (mol%)	<b>2</b> (%)	<b>3</b> (%)
2.5	35	33	10
2.5	55	52	11
2.5	100	88	0
0	100	88	0



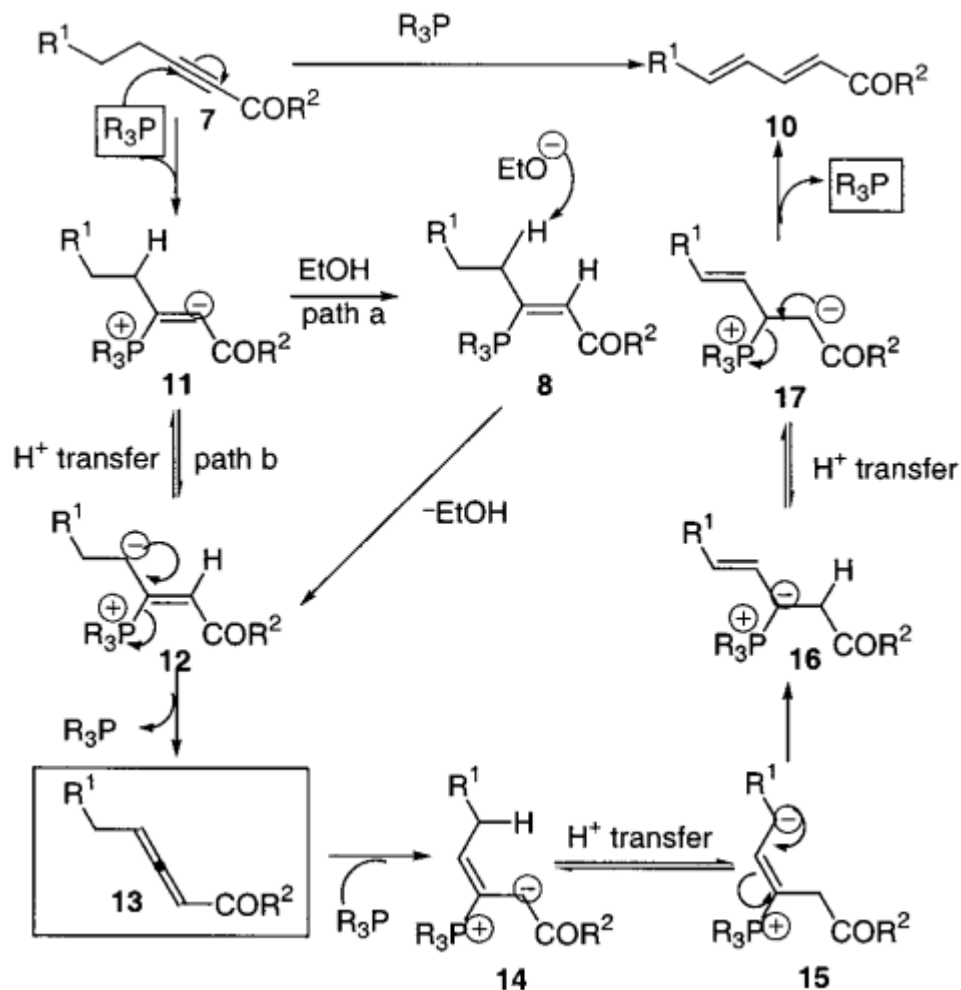
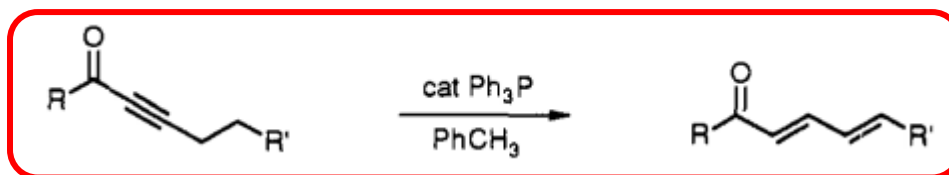
# PR<sub>3</sub> Induced Lu-Trost-Inoue Reaction



Ph<sub>3</sub>P (1 eq), EtOH (1 eq), rt, 47 h 79%  
Bu<sub>3</sub>P (1 eq), toluene, reflux, 30h 82%

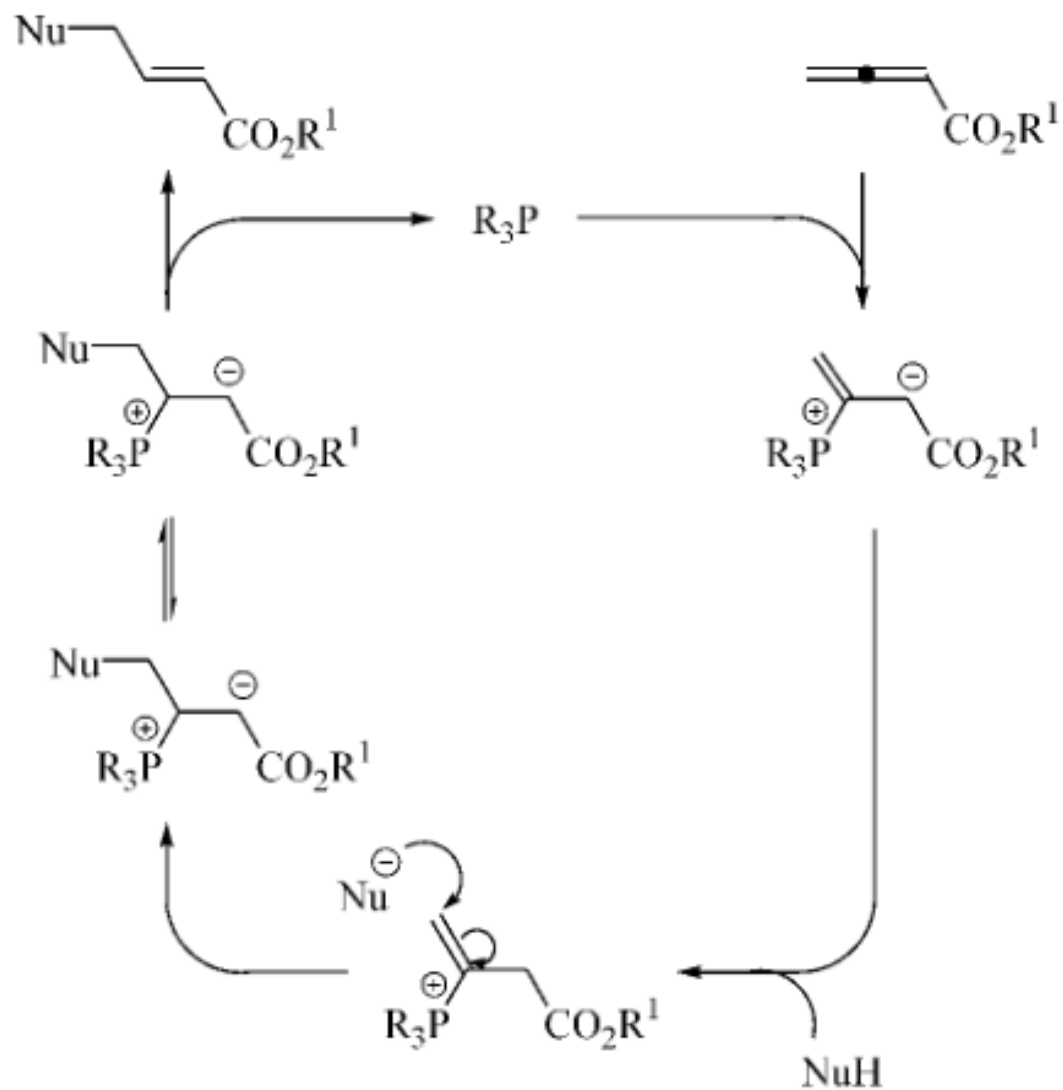
Guo, C.; Lu, X.\* J. Chem. Soc., Perkin Trans. **1993**, 1921-1923.

# PR<sub>3</sub> Catalyzed Lu-Trost-Inoue Reaction

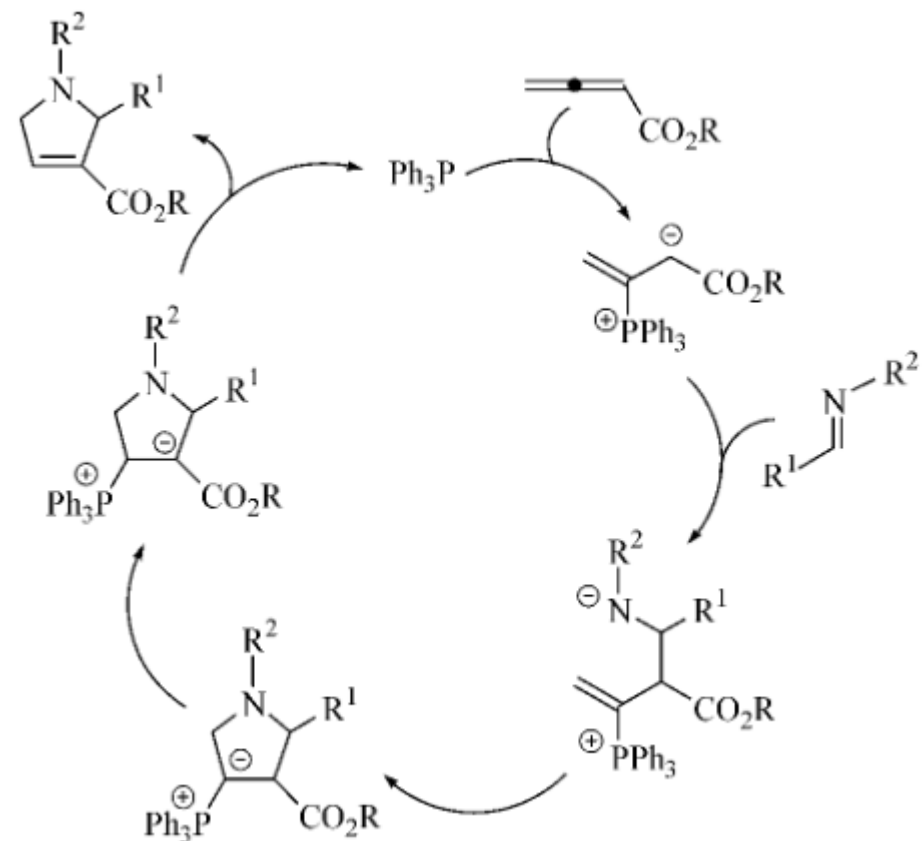
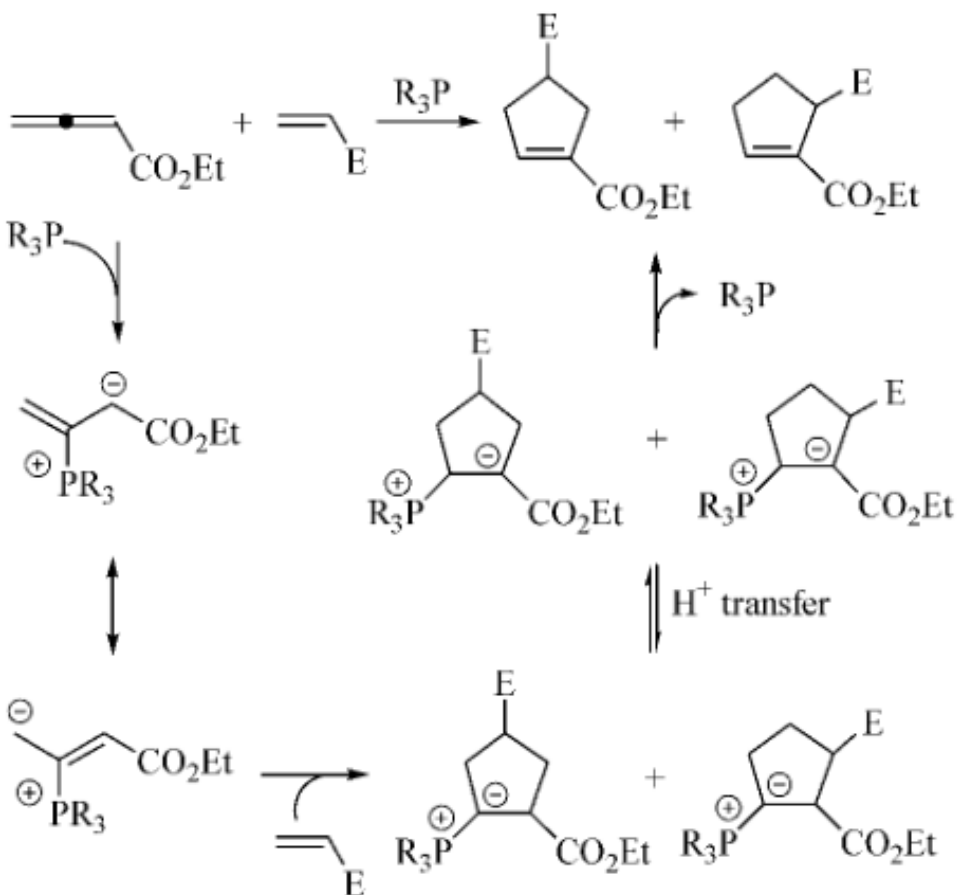




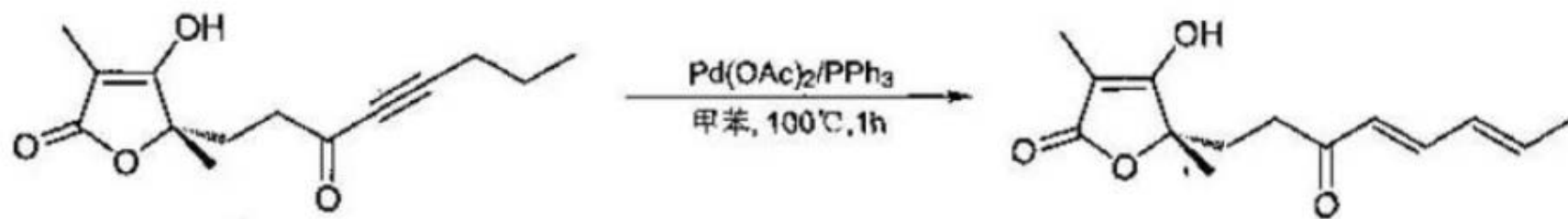
# Umpolung Reaction catalyzed by Phosphine



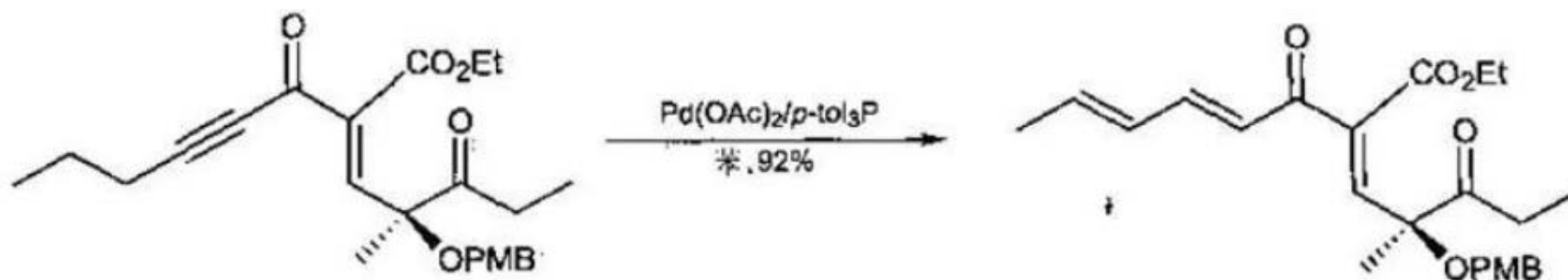
# Phosphine-Catalyzed [3 + 2] Annulation



# Application of Lu-Trost-Inuoe Reaction



【*Tetrahedron*, 1992, 48, 2925】



【*Angew. Chem. Int. Ed.* 2005, 44, 3478】