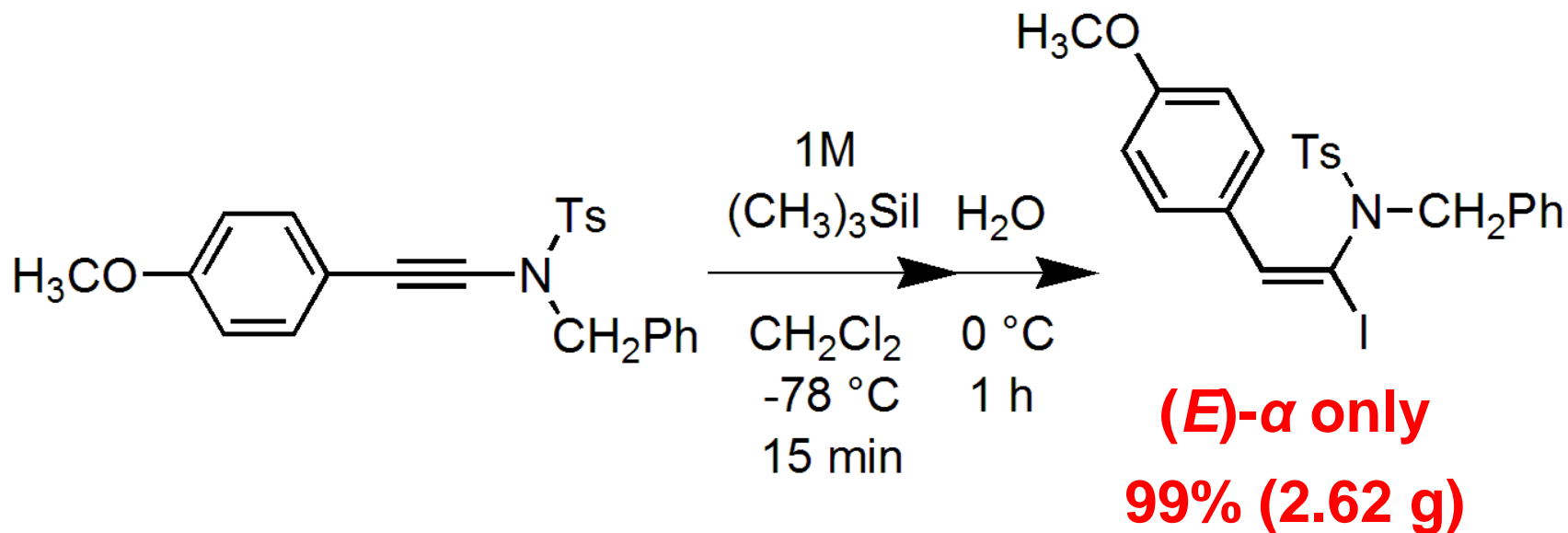
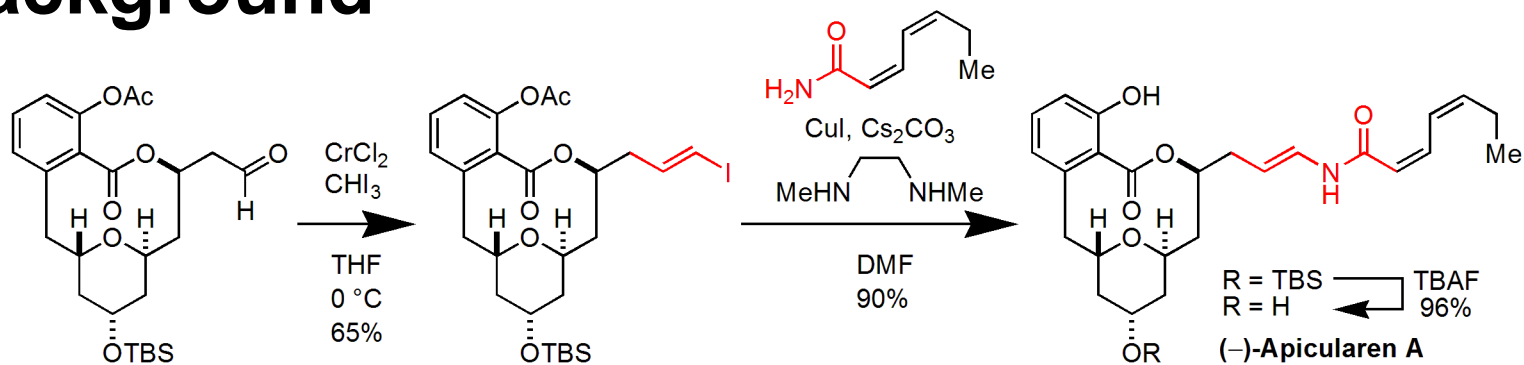


# Regio- and stereospecific synthesis of (*E*)-1-iodo-enamides with *in situ* generated HI

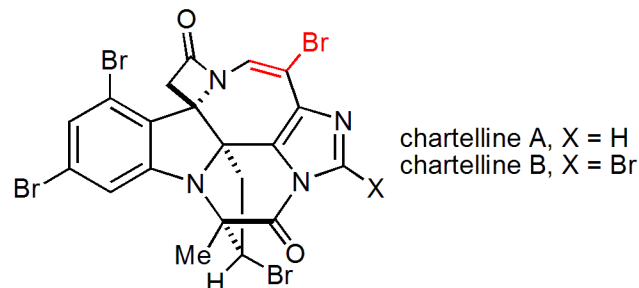
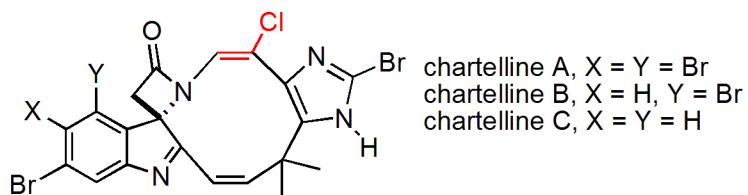


- Sato, A. H.; Ohashi, K.; Iwasawa, T. *Chem. Commun.* **2013**, 49, xxxx-xxxx.
- 特願 xxxx-xxxx (2012年12月出願) 佐藤 明広, 岩澤 哲郎

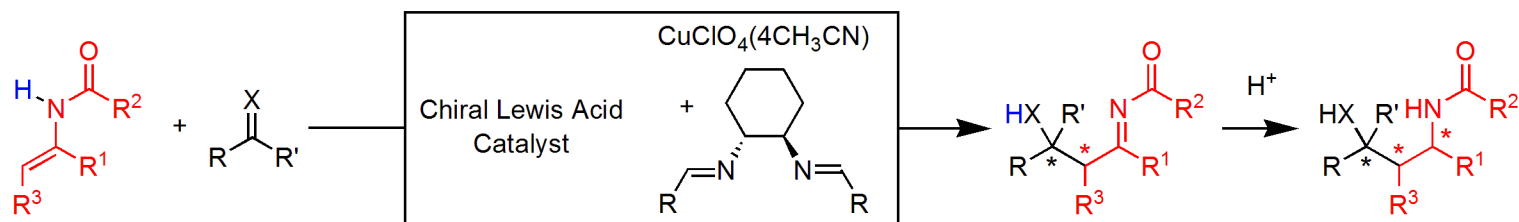
# Background



Palimkar, S. S.; Uenishi, *J. Org. Lett.* **2010**, *12*, 4160.



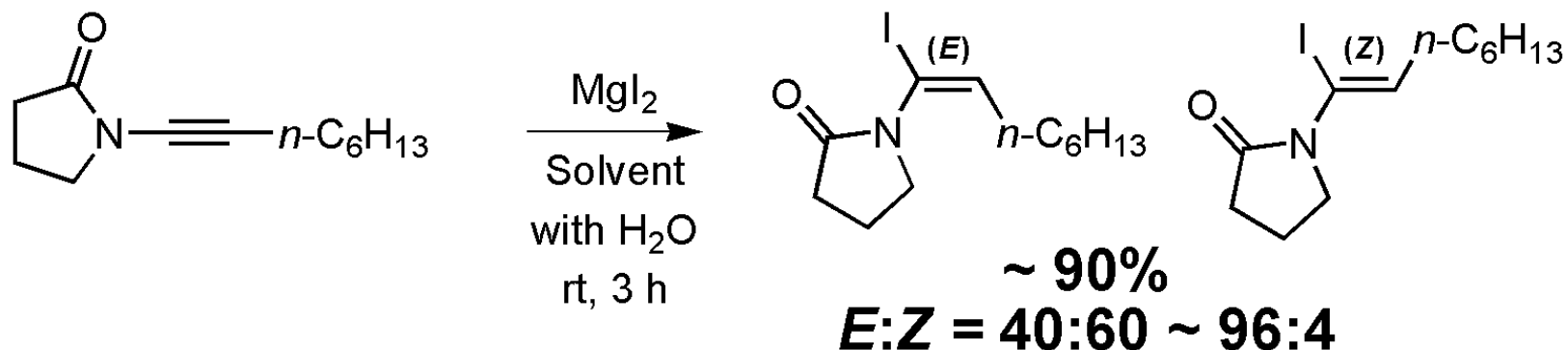
- 1) Anthoni, U.; Bock, K.; Chevlot, L.; Larsen, C.; Nielsen, P. H.; Christophersen, C. *J. Org. Chem.* **1987**, *52*, 5638-5639.
- 2) Anthoni, U.; Chevlot, L.; Larsen, C.; Nielsen, P. H.; Christophersen, C. *J. Org. Chem.* **1987**, *52*, 4709-4712.
- 3) Chevlot, L.; Chevlot, A.-M.; Gajhede, M.; Larsen, C.; Anthoni, U. *J. Am. Chem. Soc.* **1985**, *107*, 4542-4543.
- 4) Baran, P. S.; Shenvi, R. A.; Mitsos, C. A. *Angew. Chem., Int. Ed.* **2005**, *44*, 3714-3717.
- 5) Nishikawa, T.; Kajii, S.; Isobe, M. *Synlett* **2004**, 2025-2027.
- 6) Pinder, J. L.; Weinreb, S. M. *Tetrahedron Lett.* **2003**, *44*, 4141-4143.



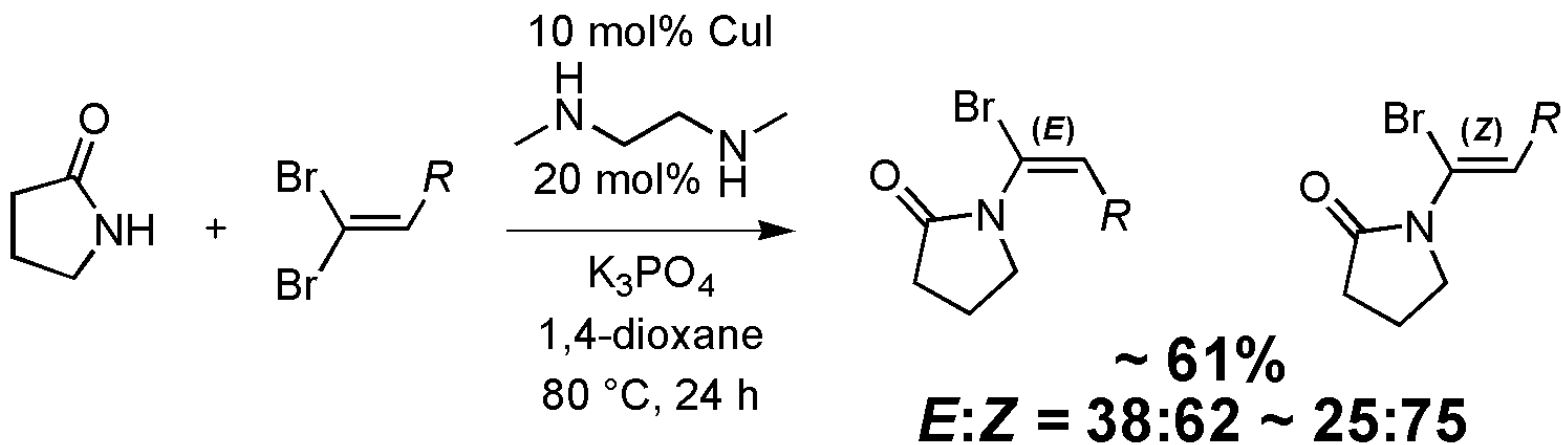
Matsubara, R.; Kobayashi, S. *Acc. Chem. Res.* **2008**, *41*, 292-301.

"Enamides and Enecarbamates as Nucleophiles in Stereoselective C-C and C-N Bond-Forming Reactions"

# Background

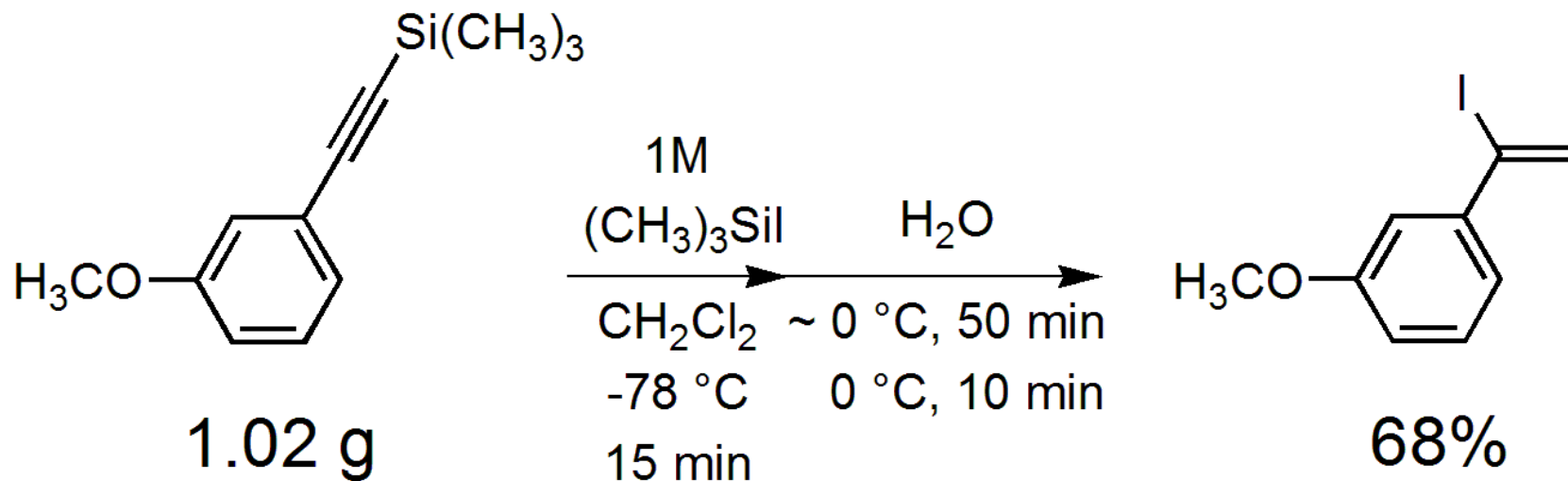


Mulder, J. A.; Kurtz, K. C. M.; Hsung, R. P.; Coverdale, H.; Frederick, M. O.; Shen, L.; Zifcsak, C. A. *Org. Lett.* **2003**, *5*, 1547-1550.

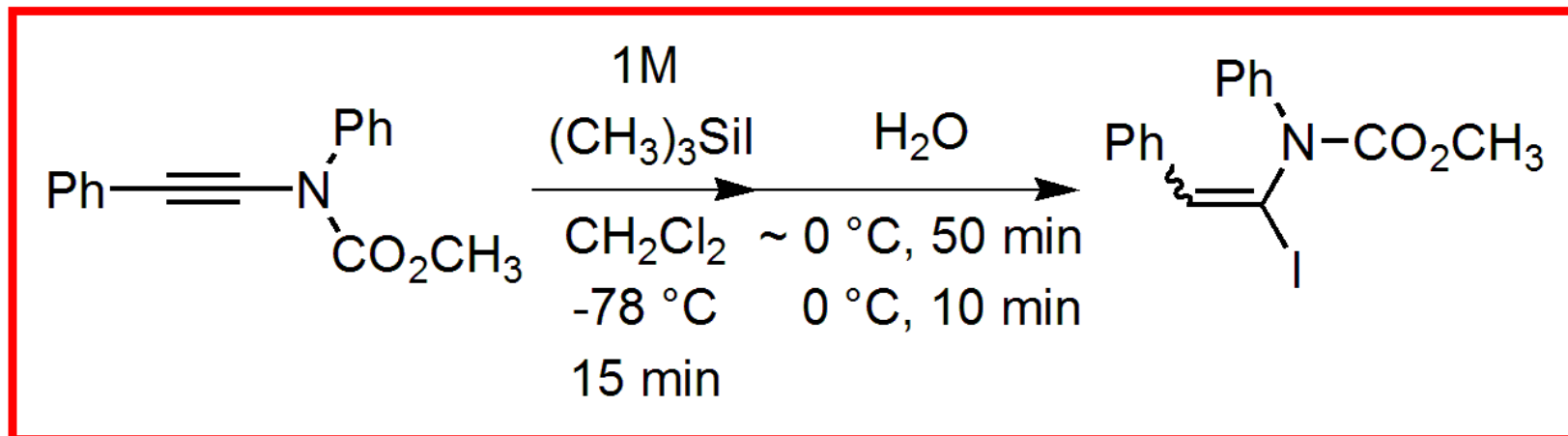


Jouvin, K.; Coste, A.; Bayle, A.; Legrand, F.; Karthikeyan, G.; Tadiparthi, K.; Evano, G. *Organometallics* **2012**, ASAP, doi: 10.1021/om3005614.

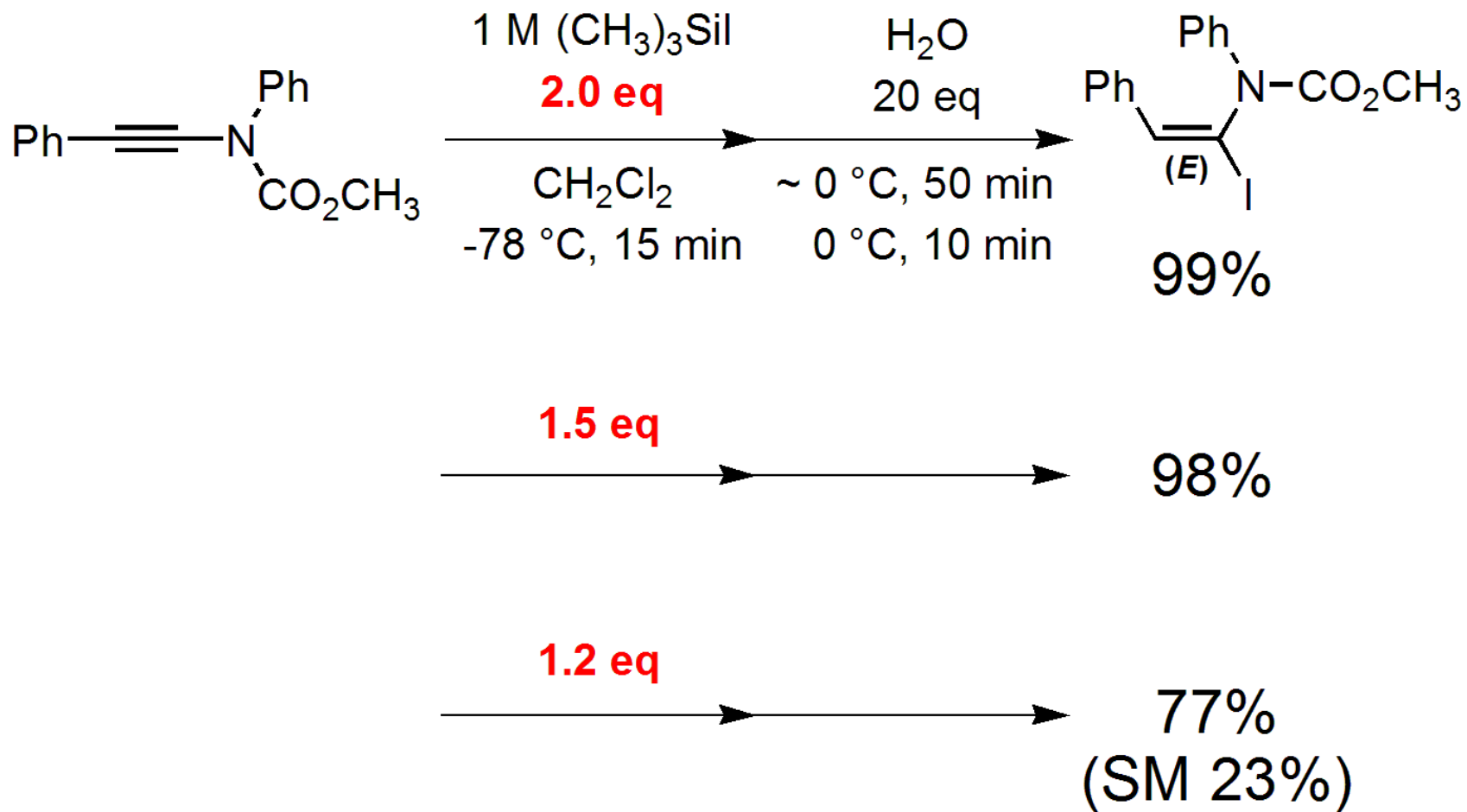
# Approach



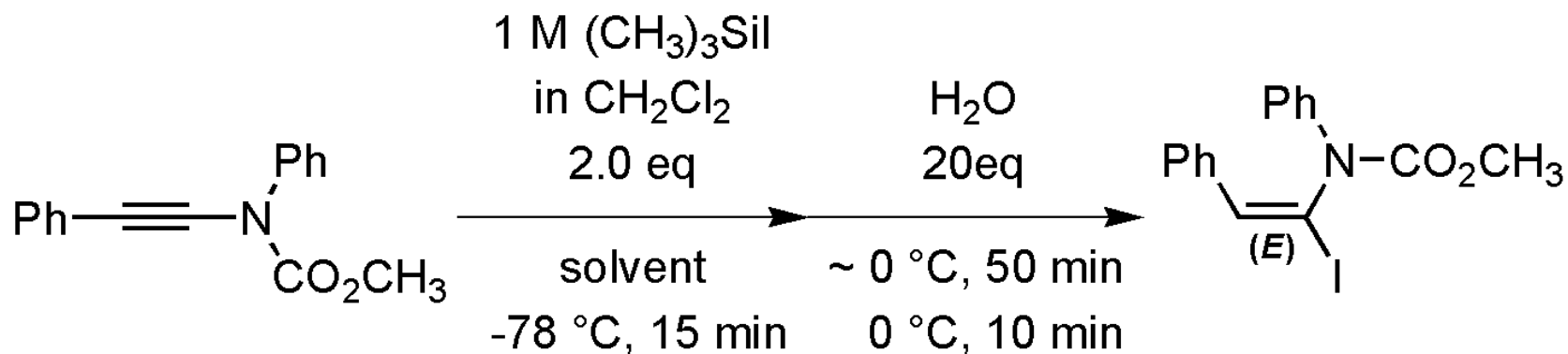
- Sato, A. H.; Mihara, S.; Iwasawa, T. *Tetrahedron Lett.* **2012**, 53, 3585-3589.
- 特願 2012-170680 (2012年7月出願) 佐藤明広, 三原森典, 岩澤哲郎



# Amount of $(\text{CH}_3)_3\text{SiI}$



# Solvent

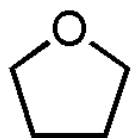


$\text{CH}_2\text{Cl}_2$   
99%

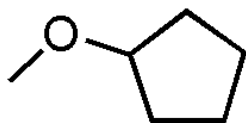
Toluene  
98%

Hexane  
99%

$\text{CH}_3\text{CN}$   
99%



65%



63%

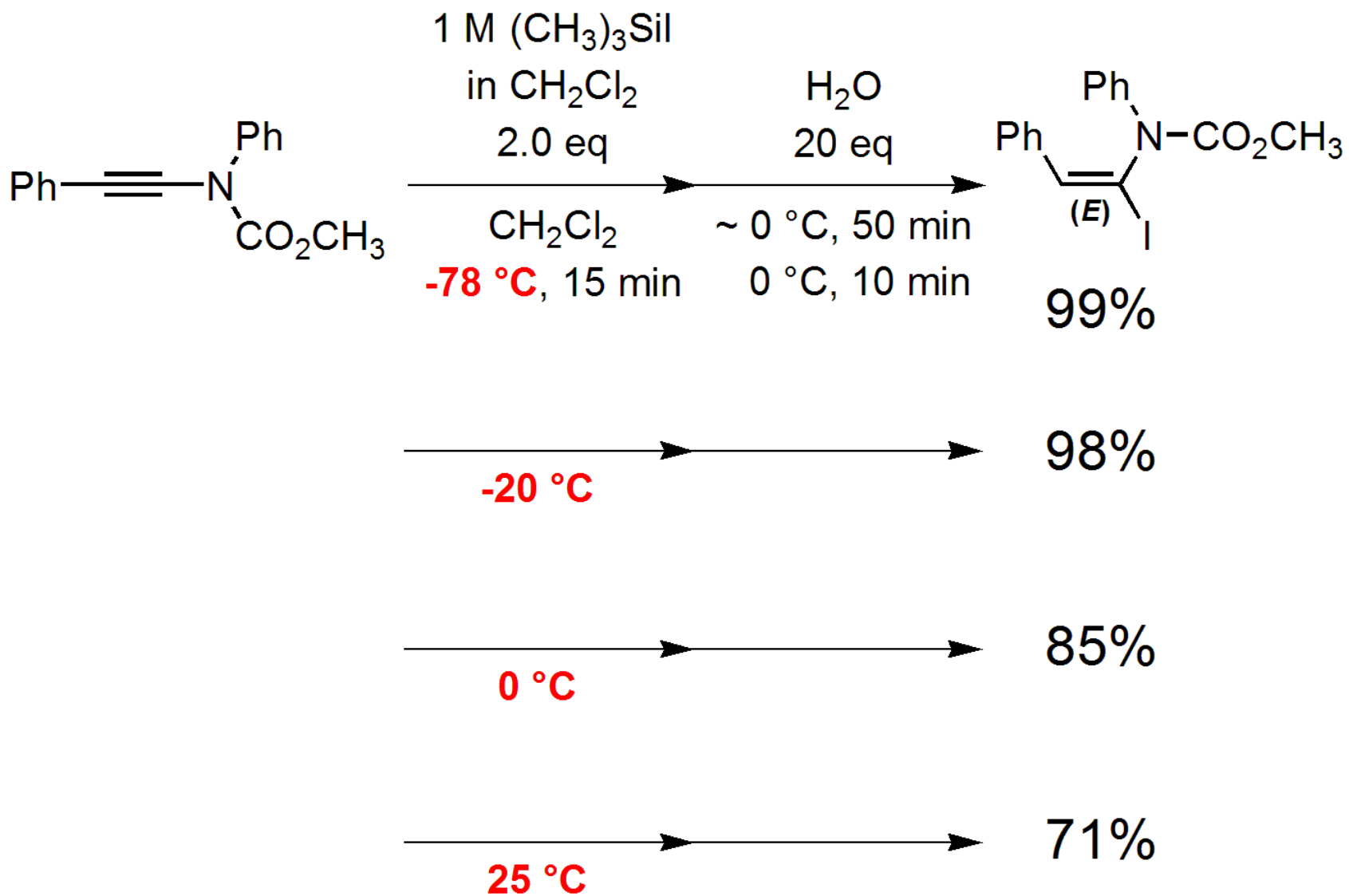
$\text{CH}_2\text{Cl}_2/\text{H}_2\text{O}$   
(4% v/v)

94%

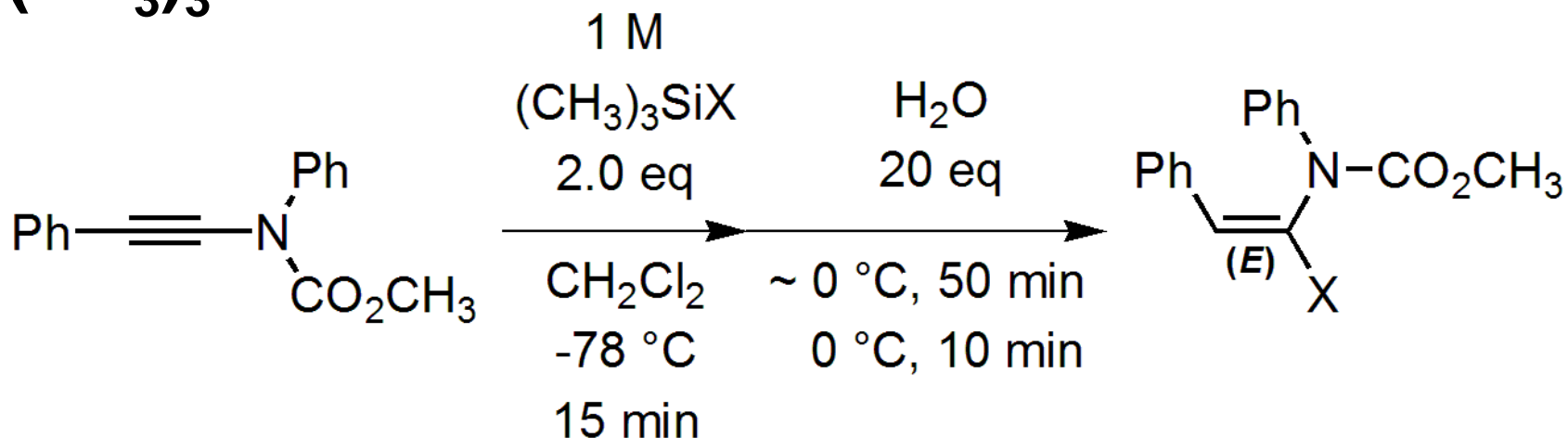
$\text{CH}_2\text{Cl}_2$   
95%

( $\text{CH}_3\text{OH}$  was  
used instead  
of  $\text{H}_2\text{O}$ .)

# Temperature



# $(\text{CH}_3)_3\text{SiX}$



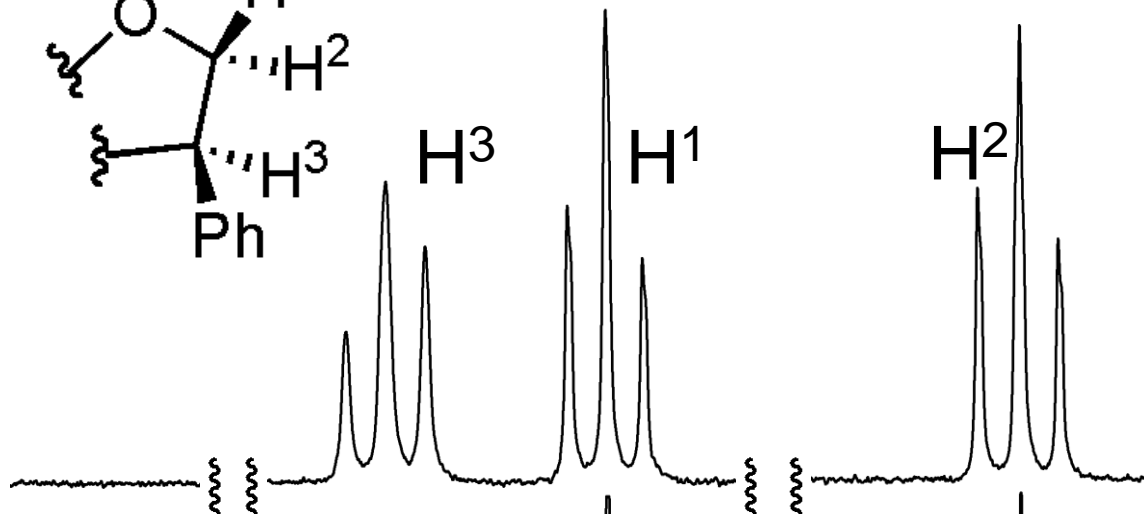
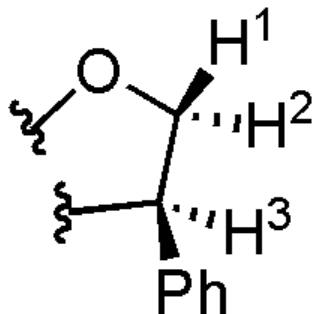
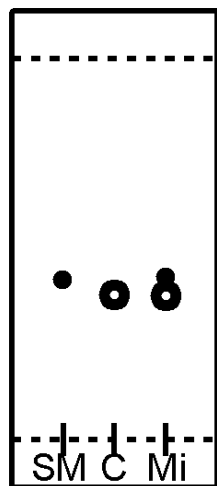
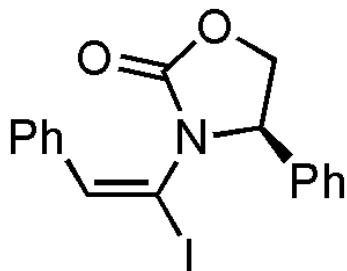
$(\text{CH}_3)_3\text{Si-X}$	% Yield	Bond energy of Si-X (kcal/mol) <i>lit.</i>
$(\text{CH}_3)_3\text{Si-I}$	99	77
$(\text{CH}_3)_3\text{Si-Br}$	99	96
$(\text{CH}_3)_3\text{Si-Cl}$	28	113

*lit.*) Walsh, R. *Acc. Chem. Res.*, **1981**, *14*, 246-252.

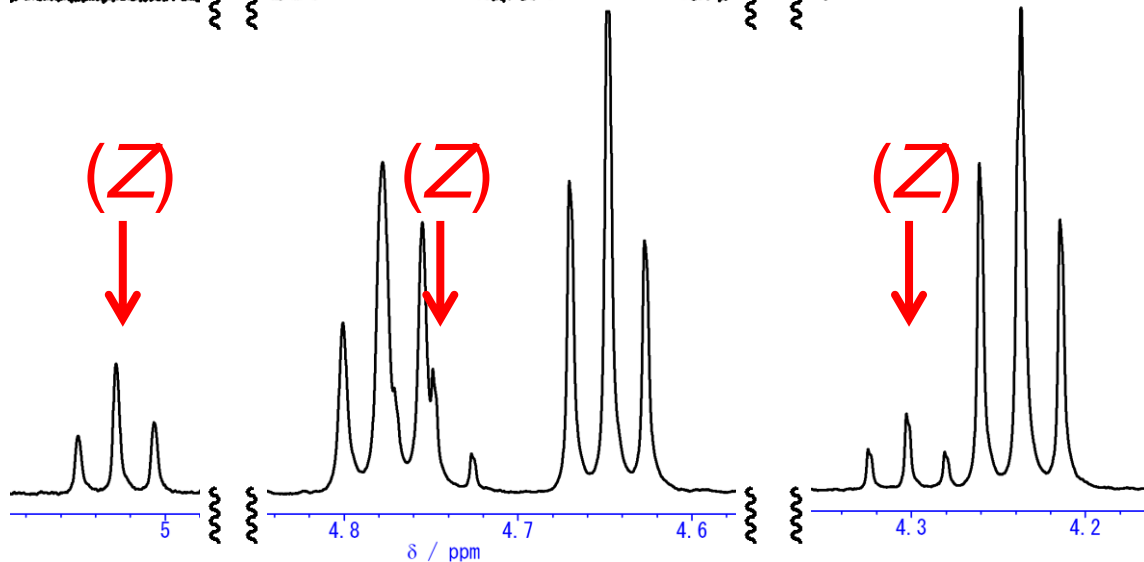
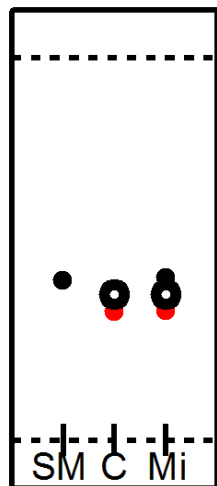


# (E)- $\alpha$ only

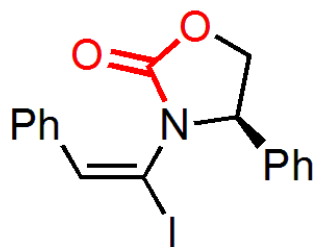
Our method  
(E)- $\alpha$  only  
99%



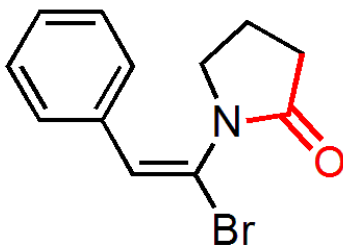
Hsung's method  
E:Z = 88:12  
mixture  
84%



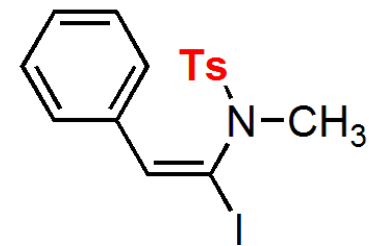
# N-EWG



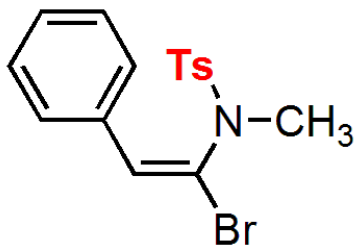
99% (387 mg)



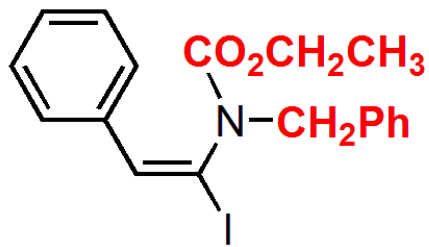
99% (919 mg)



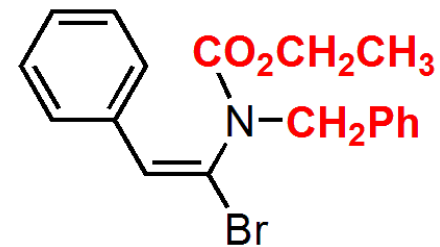
99% (412 mg)



97% (1.26 g)

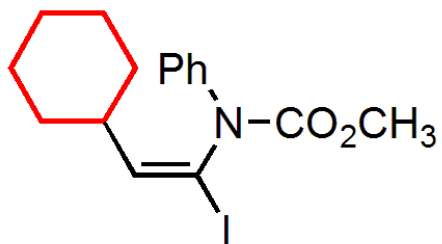


97% (393 mg)

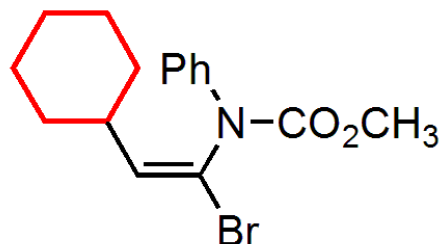


90% (329 mg)

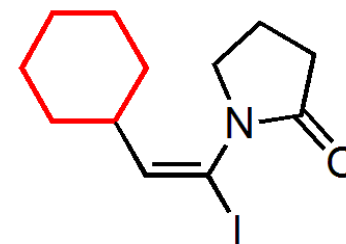
# Aliphatic vinyls



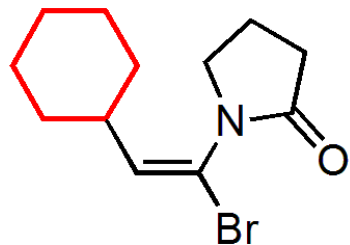
88% (680 mg)



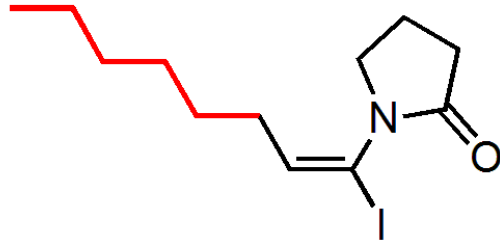
85% (576 mg)



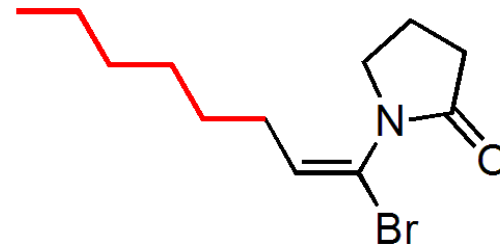
81% (257 mg)



67% (183 mg)

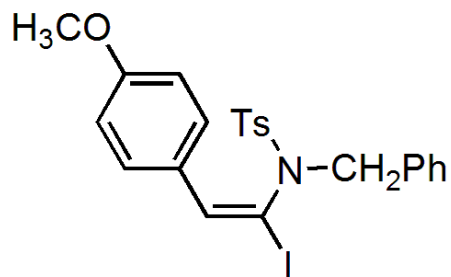


91% (585 mg)



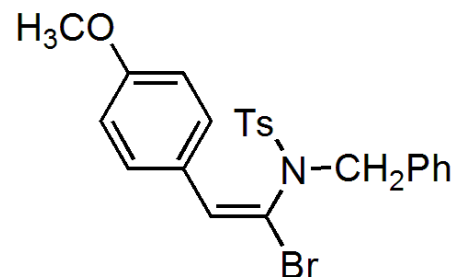
88% (478 mg)

# Gram-scale synthesis



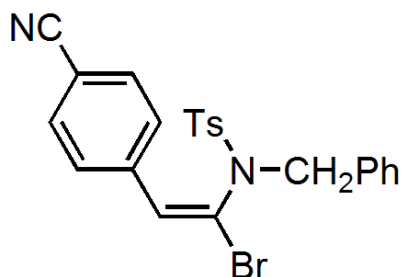
**99% (2.62 g)**

yellow viscous materials



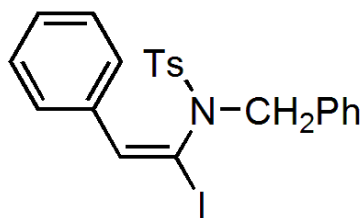
**99% (2.39 g)**

yellow viscous materials



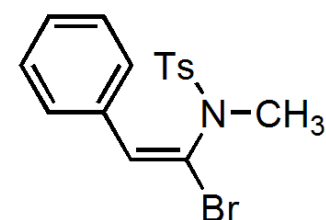
**99% (1.16 g)**

white solid



**93% (2.53 g)**

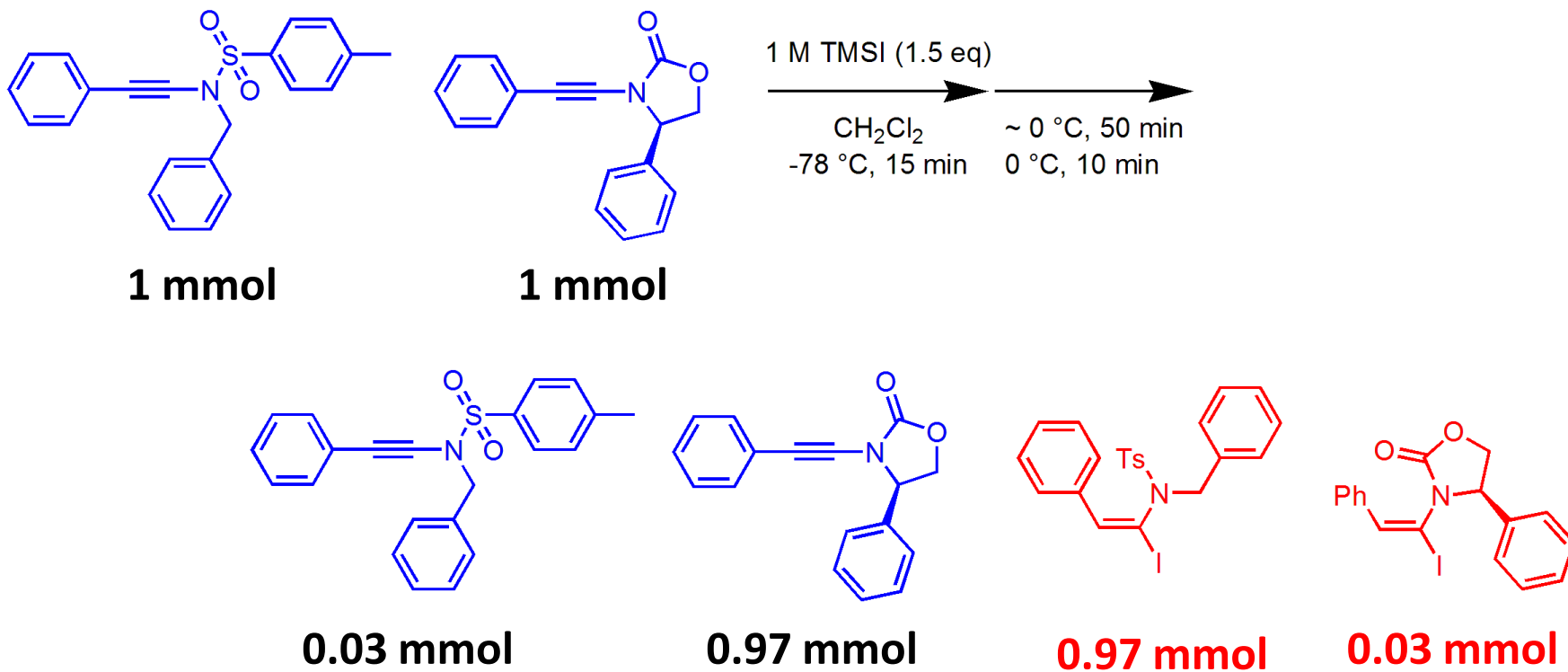
yellow solid



**97% (1.26 g)**

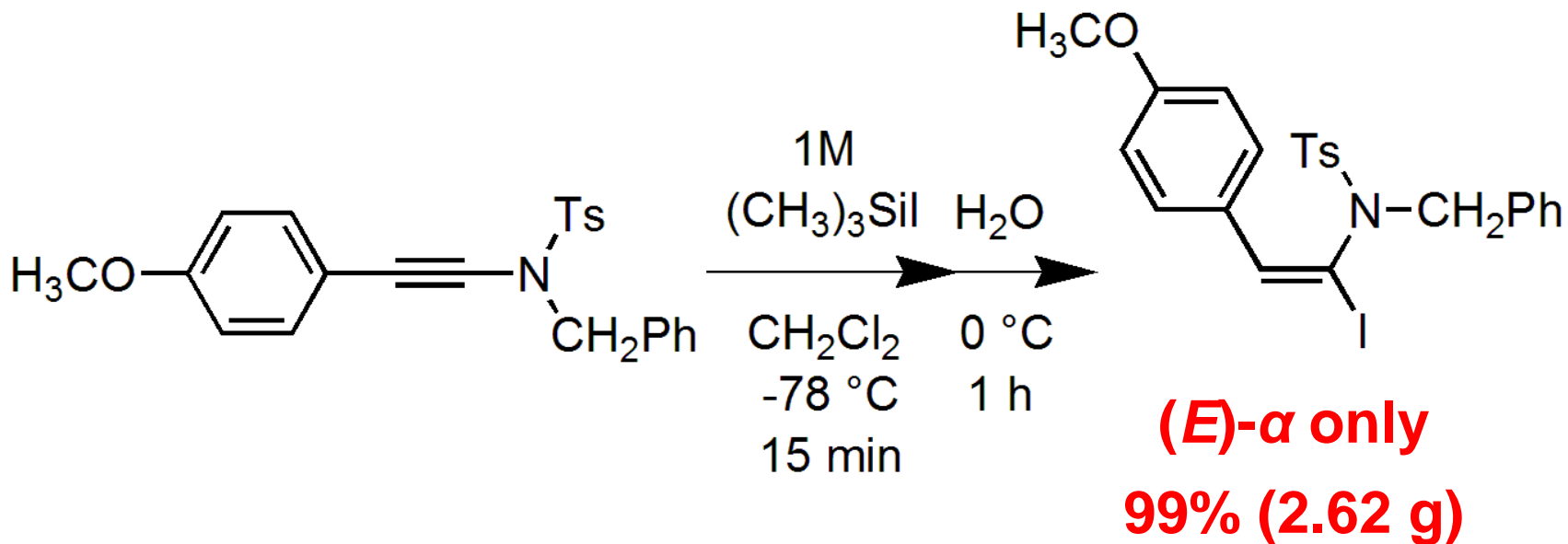
pale yellow solid

# A competitive experiment



■ Possible chelation of Si with O

# Summary



- Sato, A. H.; Ohashi, K.; Iwasawa, T. *Chem. Commun.* **2013**, 49, xxxx-xxxx.
- 特願 xxxx-xxxx (2012年12月出願) 佐藤 明広, 岩澤 哲郎