

DOMINO CO

Allylation / carbonylations domino reactions : concept and applications

CP2D 2008

André Mortreux (coordinator), Mathieu Sauthier, Yves Castanet, Hélène Bonin

UCCS, UMR CNRS 8181 Catalyse et Chimie Moléculaire, ENSCL/USTL, 59652 Villeneuve d'Ascq Cedex

Giovanni Poli, Frédéric Liron, Guillaume Prestat

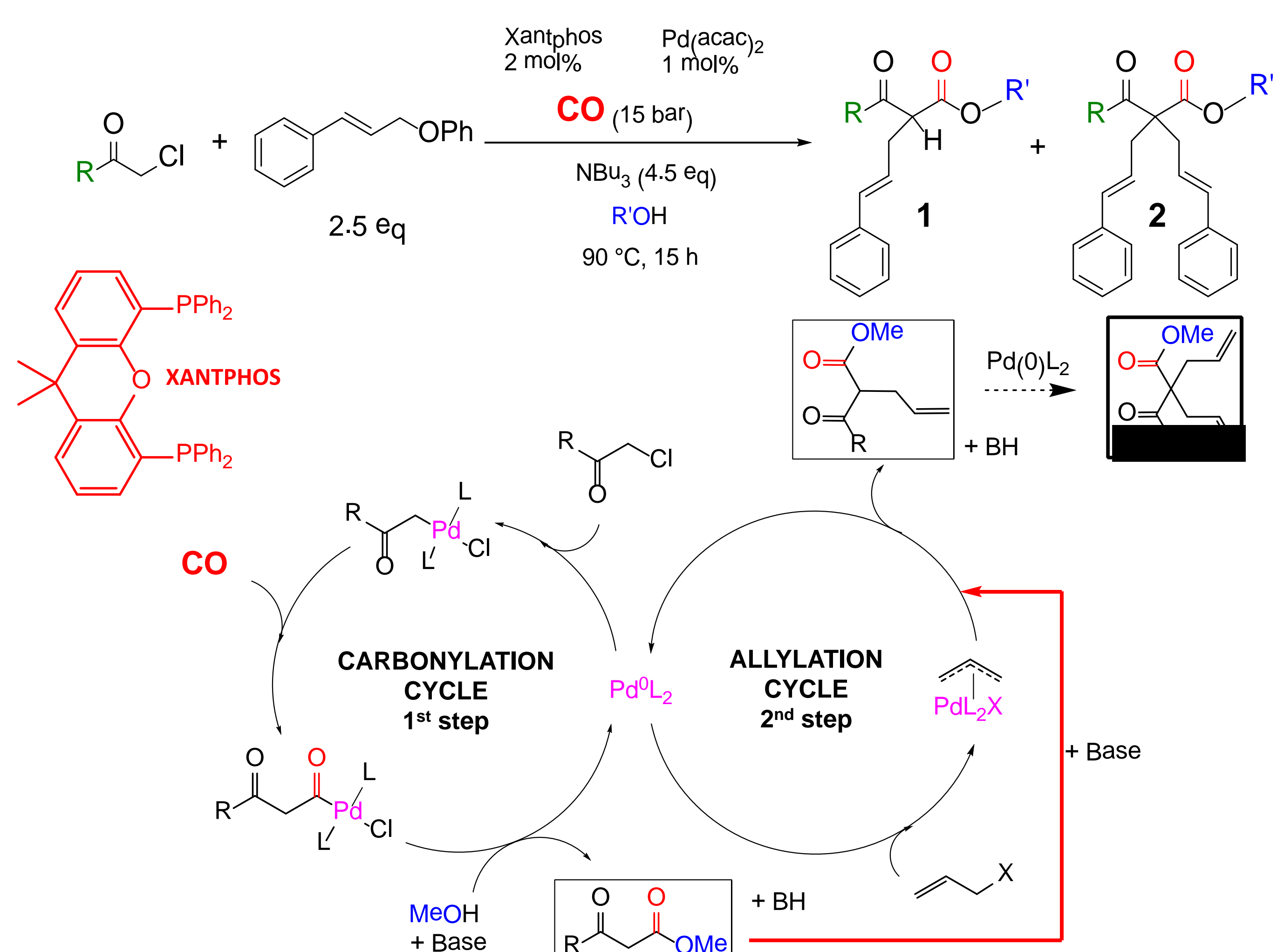
UPMC, Synthèses Sélectives et Organométalliques, IPCM, 75252 Paris Cedex

Work carried out by Benoit Wahl (Lille) and Steven Giboulot (Paris) PhD students funded by the ANR

In the frame of the CP2D ANR project **DOMINO-CO**, we developed two carbonylative palladium-catalyzed pseudo-domino type I sequences. The former, studied in Lille, involved an alkoxy-carbonylation / allylation succession, whereas the latter, studied in Paris, entailed an allyloxy-carbonylation / decarboxylative allylation chain. Both sequences start from readily available α -chloroketones and share the generation of intermediate β -ketoesters.

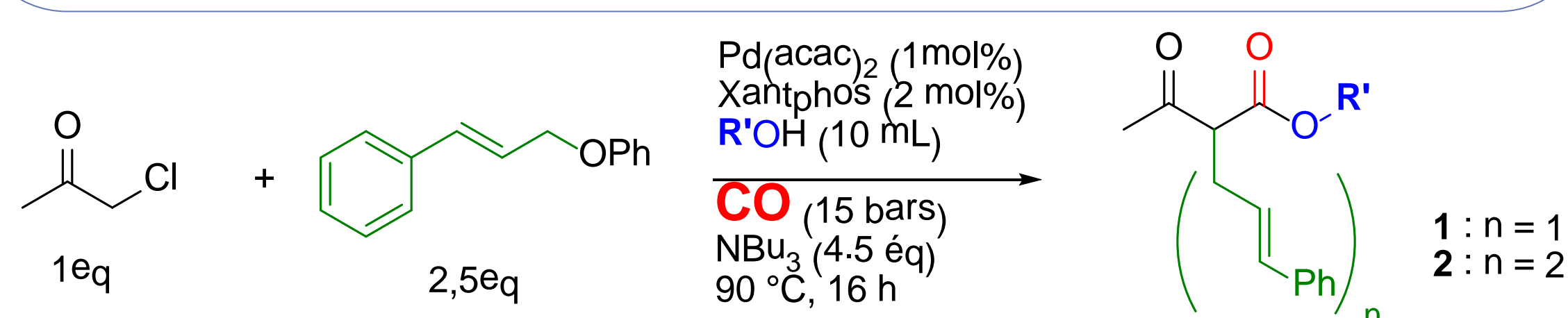
Such sequences fulfill **atom economy (use of CO and catalysis)** as well as **step economy (domino) requirements**, and represent a considerable challenge, as **only the fine and judicious tuning of the reaction conditions and the design of the ligand may render compatible the two steps on the same catalyst allowing to obtain the desired concatenated catalysis in a single synthetic operation.**

Carbonylation / allylation



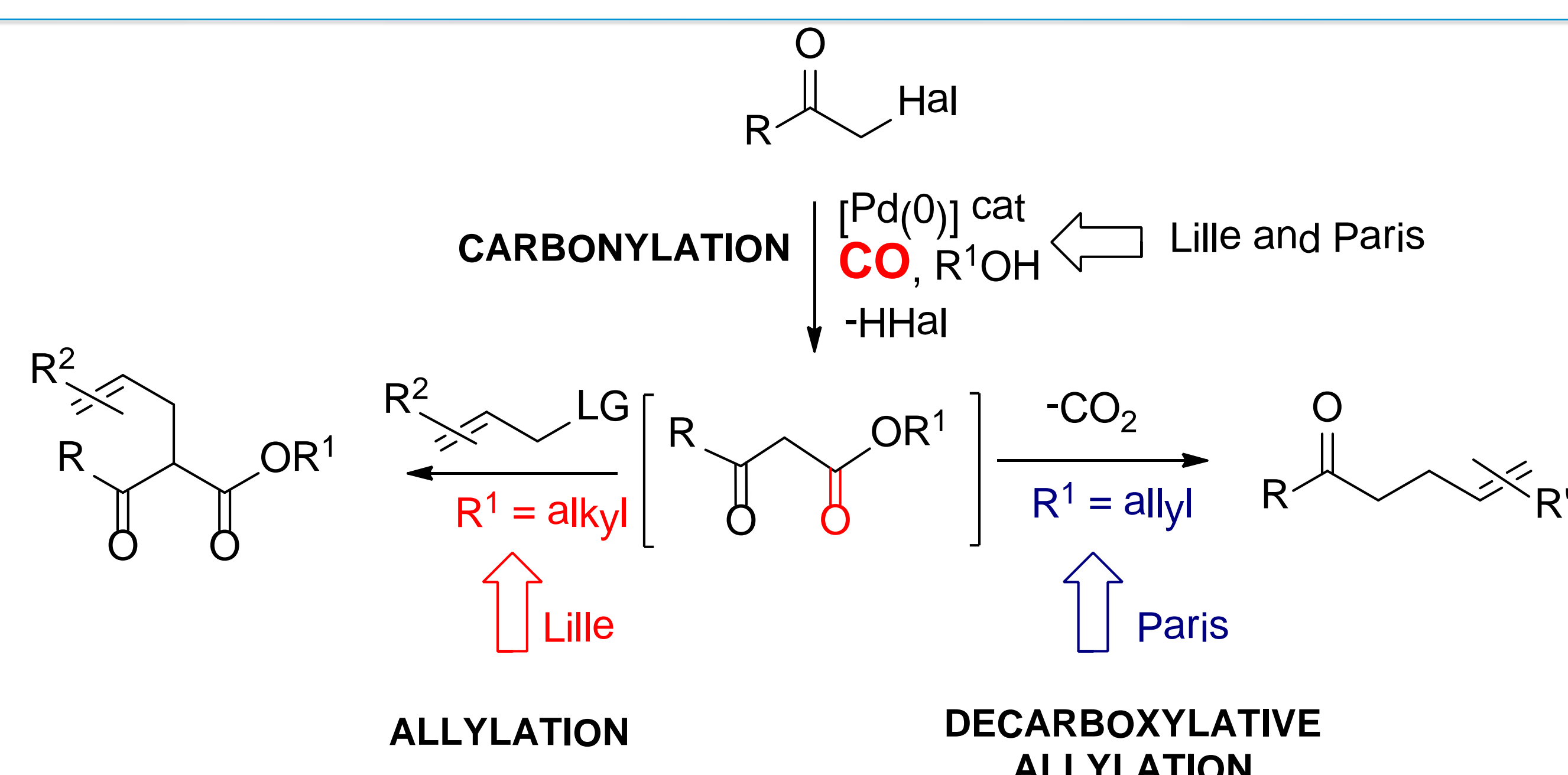
Yields into mono (1) and disubstituted (2) allylation products

Starting material	1	2	Starting material	1	2	Starting material	1	2
	62%	0%		30%	54%		53%	-
	23%	55%		65%	5%		23%	-
	37%	39%		20%	-			

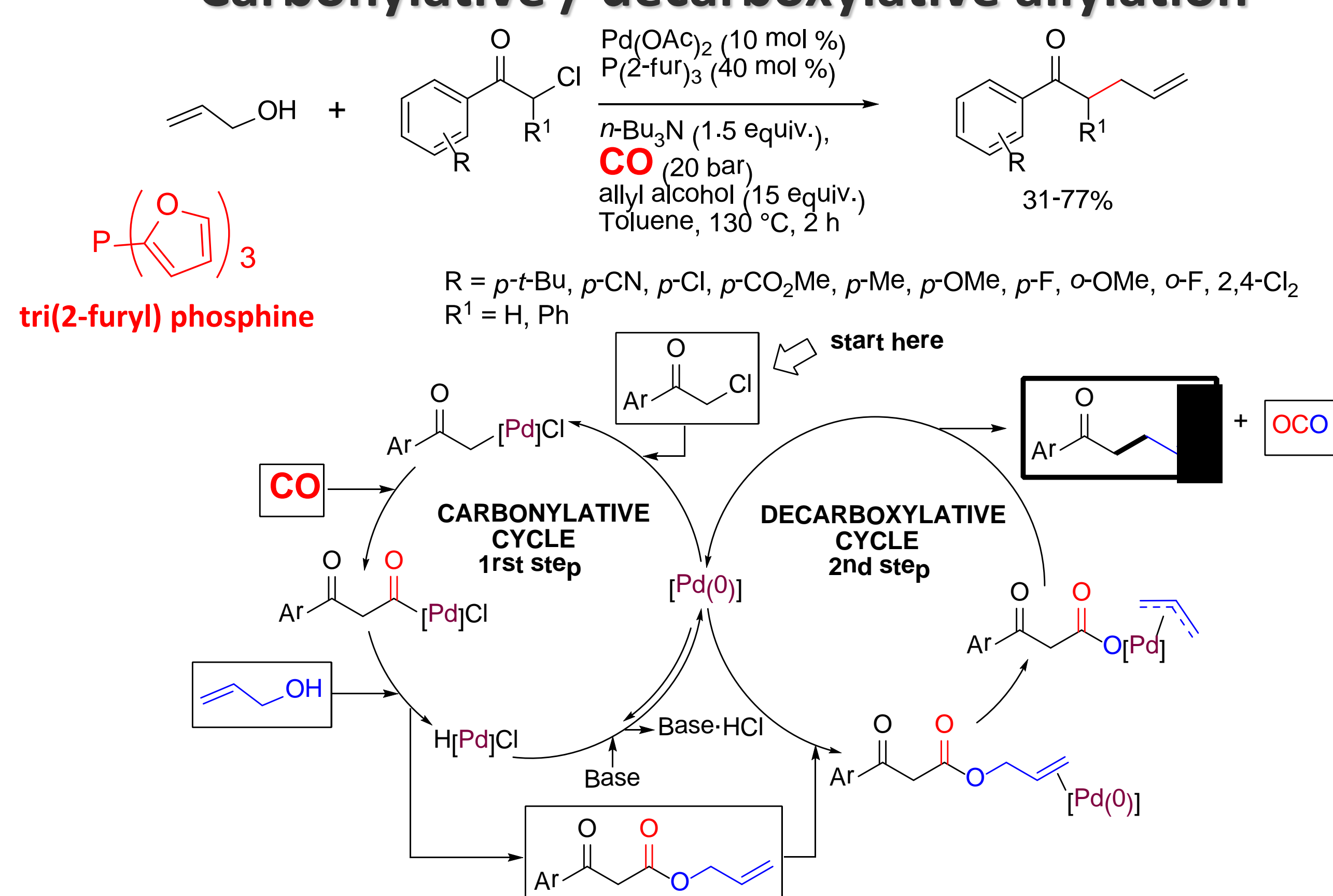


Generalization to other alcohols

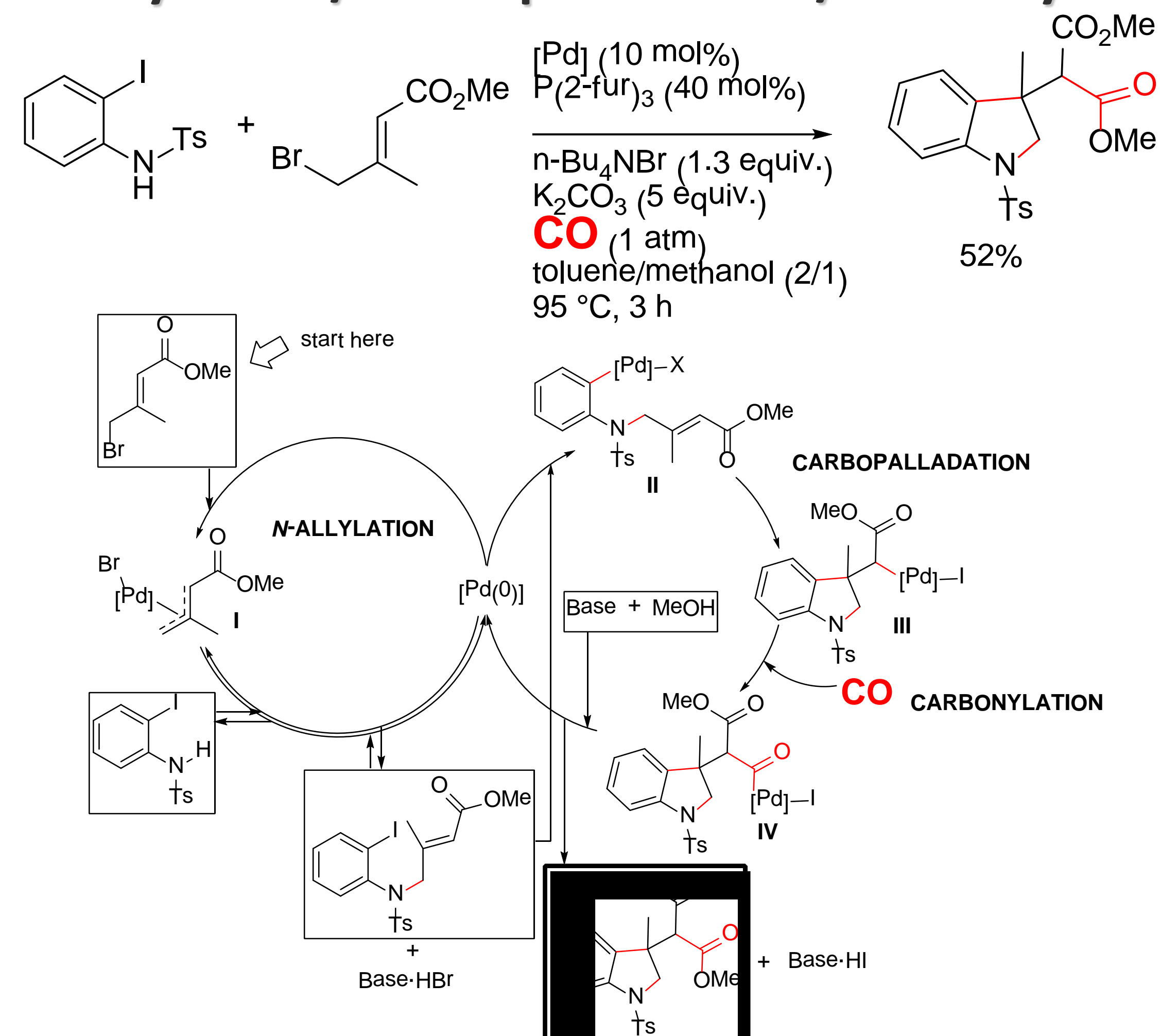
Alcohol	1	2
MeOH	12%	84%
	14%	85%
	10%	73%



Carbonylative / decarboxylative allylation



N-Allylation / Carbopalladation / Carbonylation



Wahl, B.; Bonin, H.; Mortreux, A.; Giboulot, S.; Liron, F.; Poli, G.; Sauthier, M. *Adv. Synth. Catal.*, DOI: 0.1002/adsc.201200378

Wahl, B.; Giboulot, S.; Mortreux, A.; Castanet, Y.; Sauthier, M.; Liron, F.; Poli, G. *Adv. Synth. Catal.*, **2012**, 1077-1083.

Giboulot, S.; Liron, F.; Prestat, G.; Wahl, B.; Sauthier, M.; Castanet, Y.; Mortreux A.; Poli, G. *Chem. Commun.* **2012**, 48, 5889-5891.

CONTACT :

Prof. André Mortreux
ENSCL BP 90108 59652 Villeneuve d'Ascq Cedex
andre.mortreux@enscl-lille.fr