

Organometallics Chemistry

(CHEM-7149)

Online Lectures (OrganoRu)
(Grubb's Metathesis)

Prof Dr Abdul Rauf Raza
Professor (Tenured)
Institute of Chemistry
University of Sargodha, Sargodha

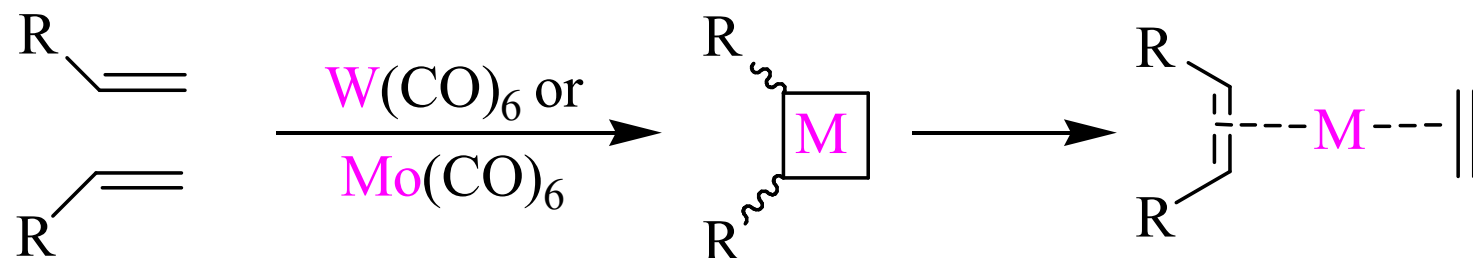
Periodic Table

s-Block metals												p-Block Elements	
Group-I	Group-II											XIII	XIV
H												B	C
Li	Be											Al	Si
Na	Mg											Ga	Ge
K	Ca	III	IV	V	VI	VII	VIII	IX	X	XI	XII	In	Sn
Rb	Sr	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Tl	Pb
Cs	Ba	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd		
Fr	Ra	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg		

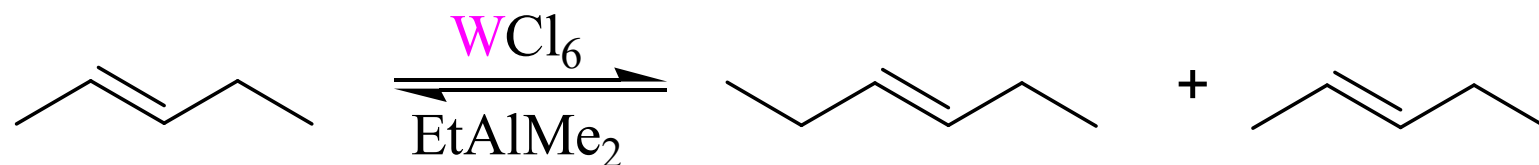
OrganoRu = Grubbs' Catalyst
 OrganoMo = Schrock's Catalyst
 OrganoW = Chauvin's Catalyst

d-Block metals

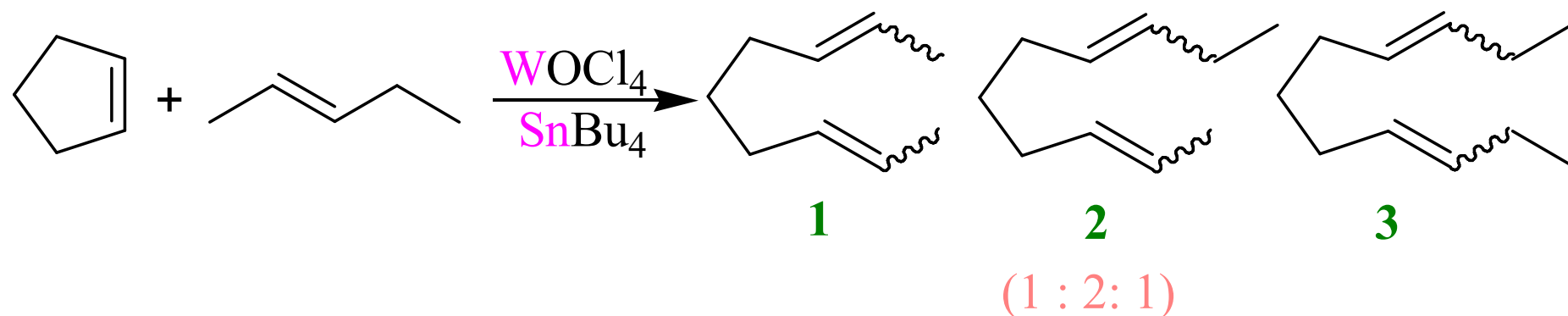
History of Metathesis



Disproportionation Theory by Phillips Petroleum Company (1964)

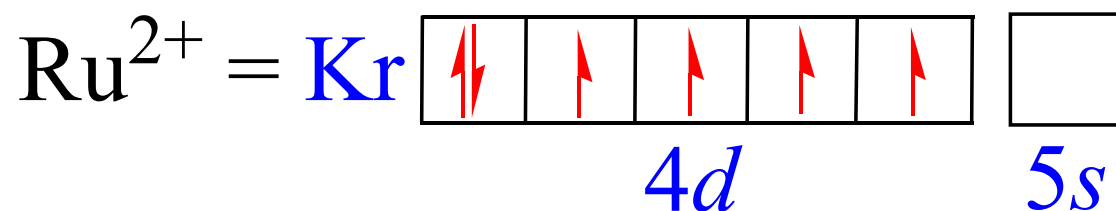
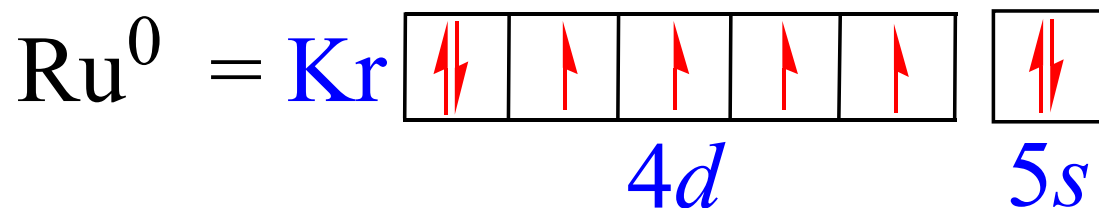


Olefine Metathesis by Goodyear Tyre Company (1967)

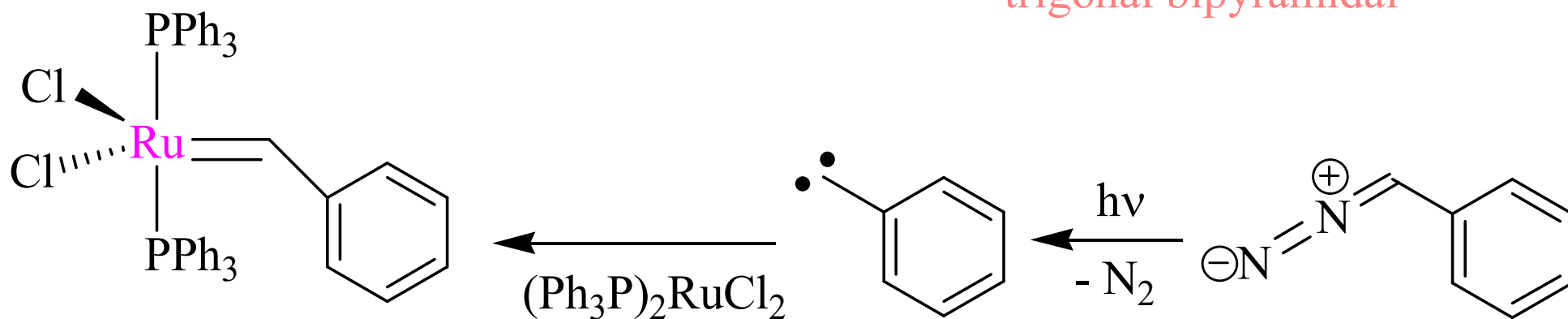


Chauvin proposed 4-membered metallocycles intermediates (1971)

Preparation of OrganoRu

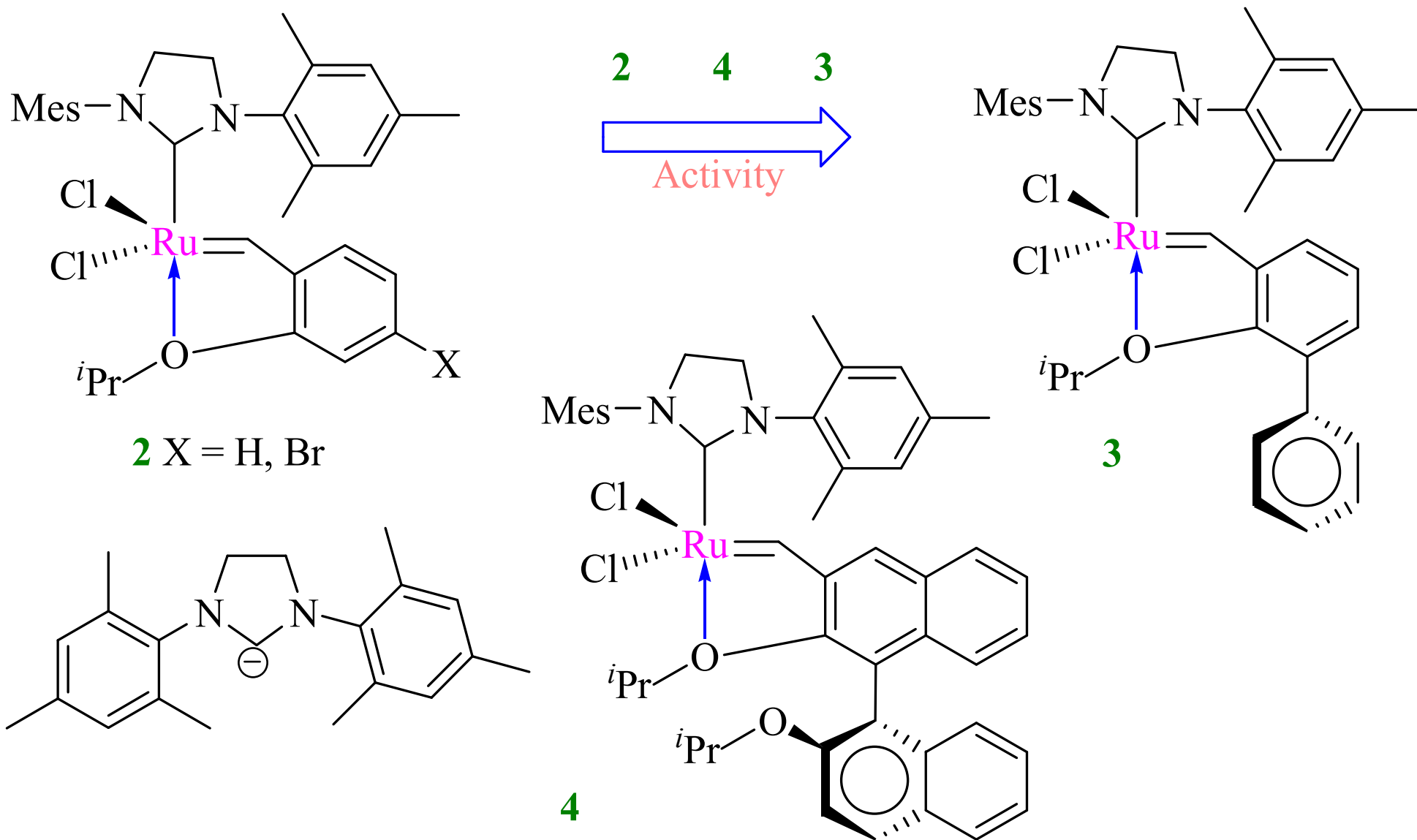


trigonal bipyramidal

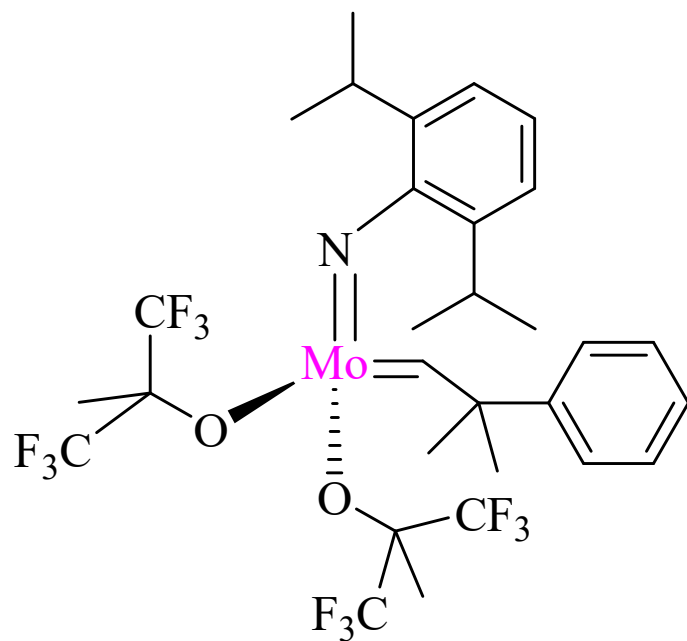


Grubbs' Catalyst
(1st Generation Catalyst)

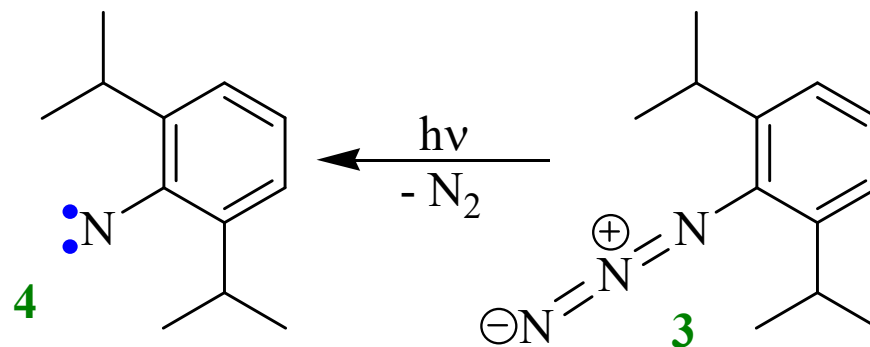
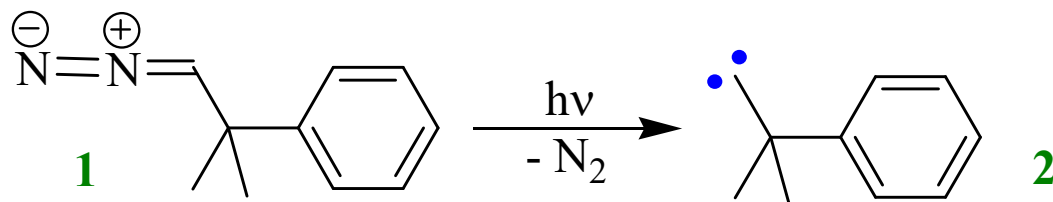
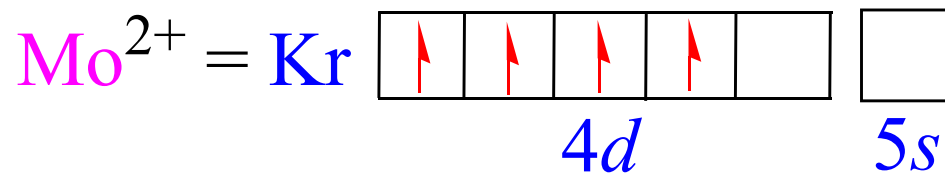
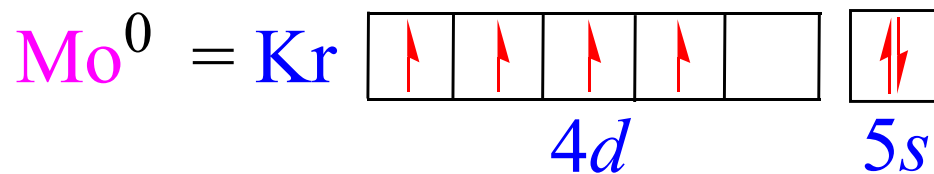
Second Generation Grubbs' Catalysts



Schrock's Catalyst



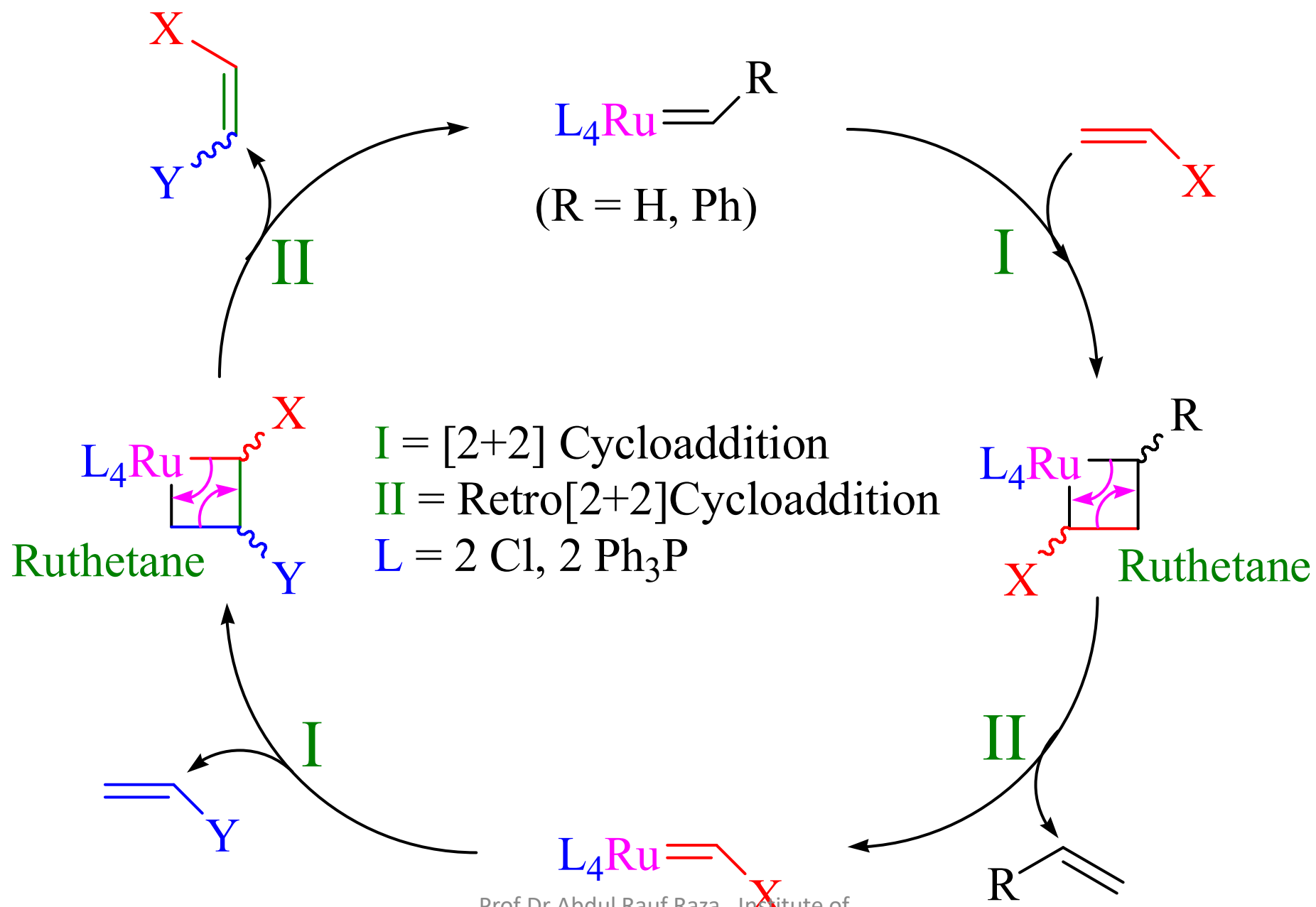
Schrock's Catalyst



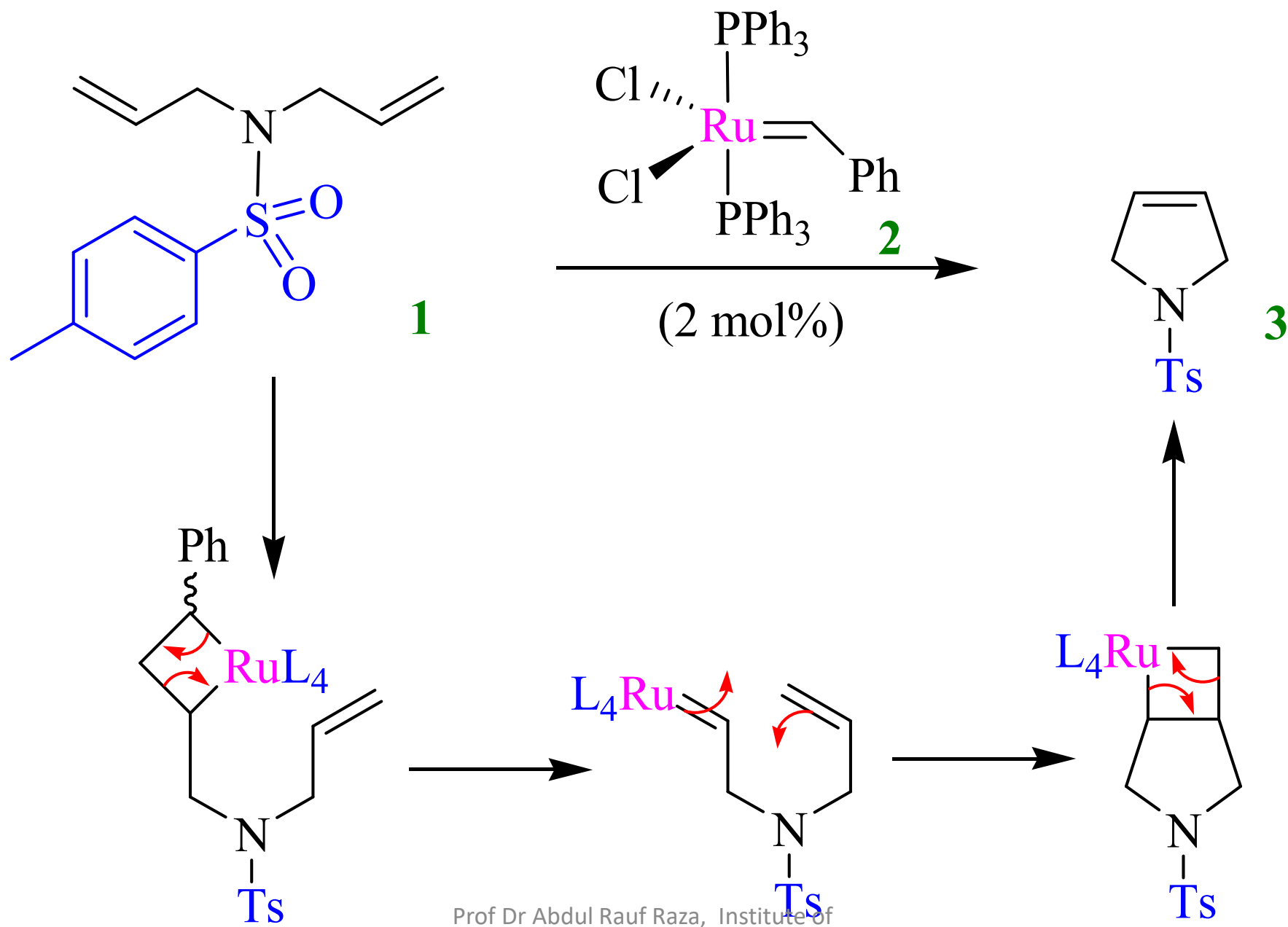
Nobel Prize (2005)
in Chemistry

Robert H. Grubbs (CIT, USA)
Richard R. Schrock (MIT, USA)
Yves Chauvin (France)

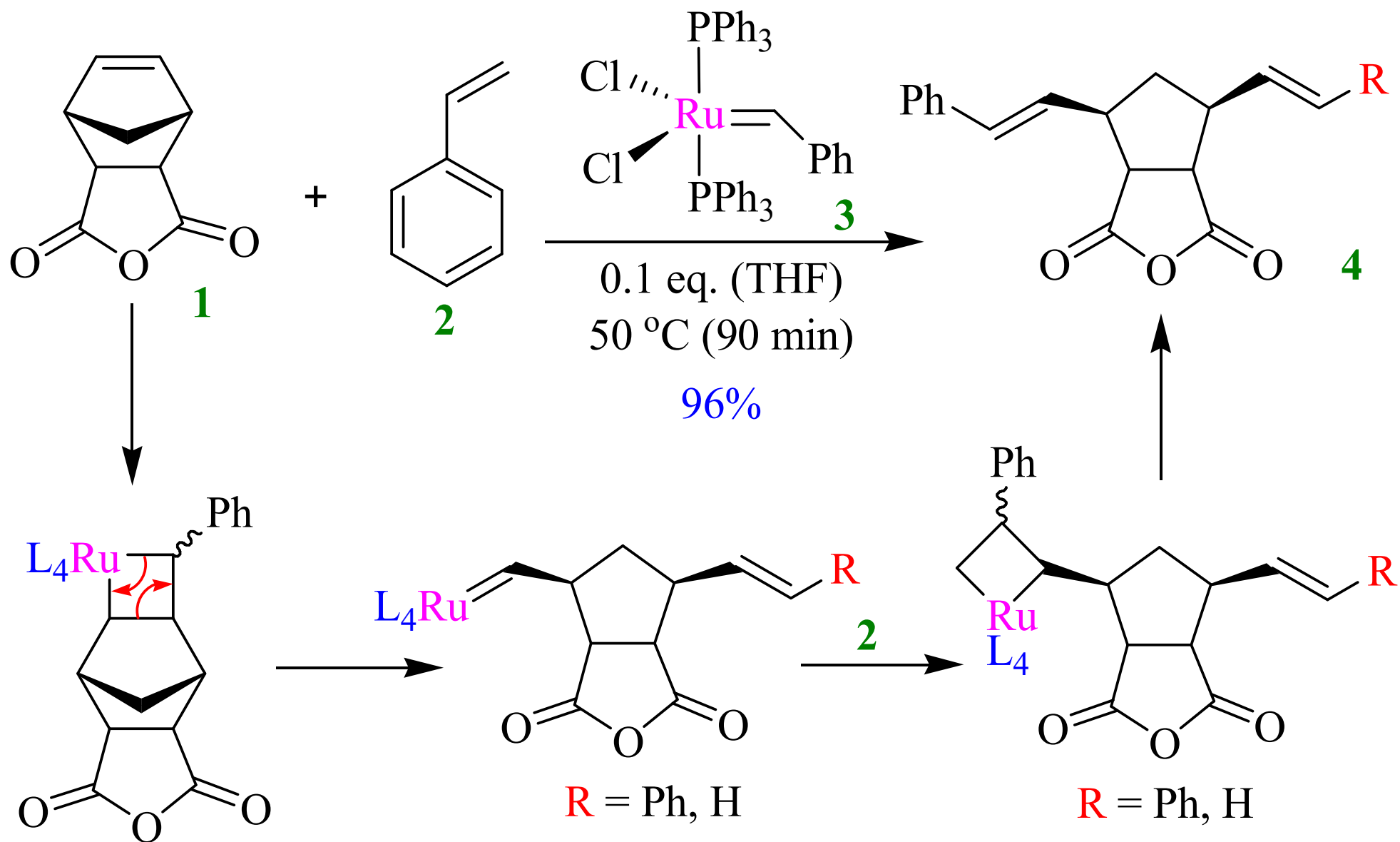
Mechanism



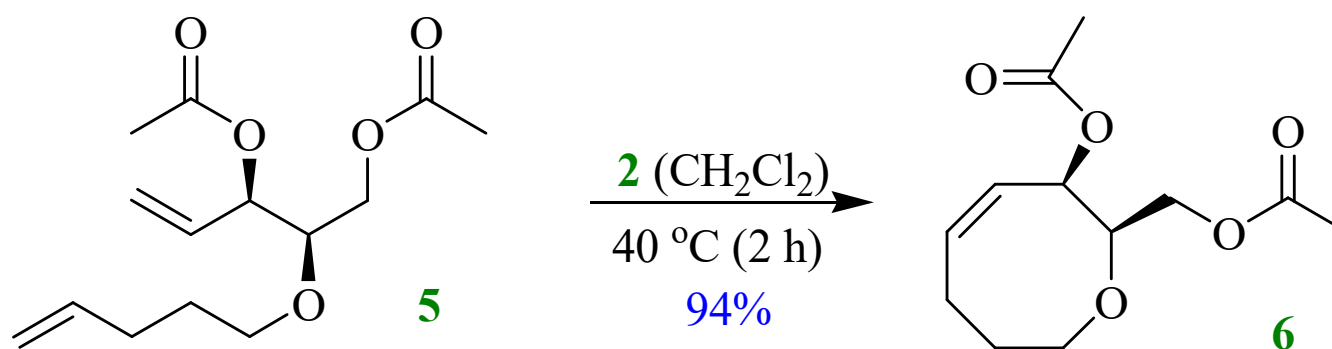
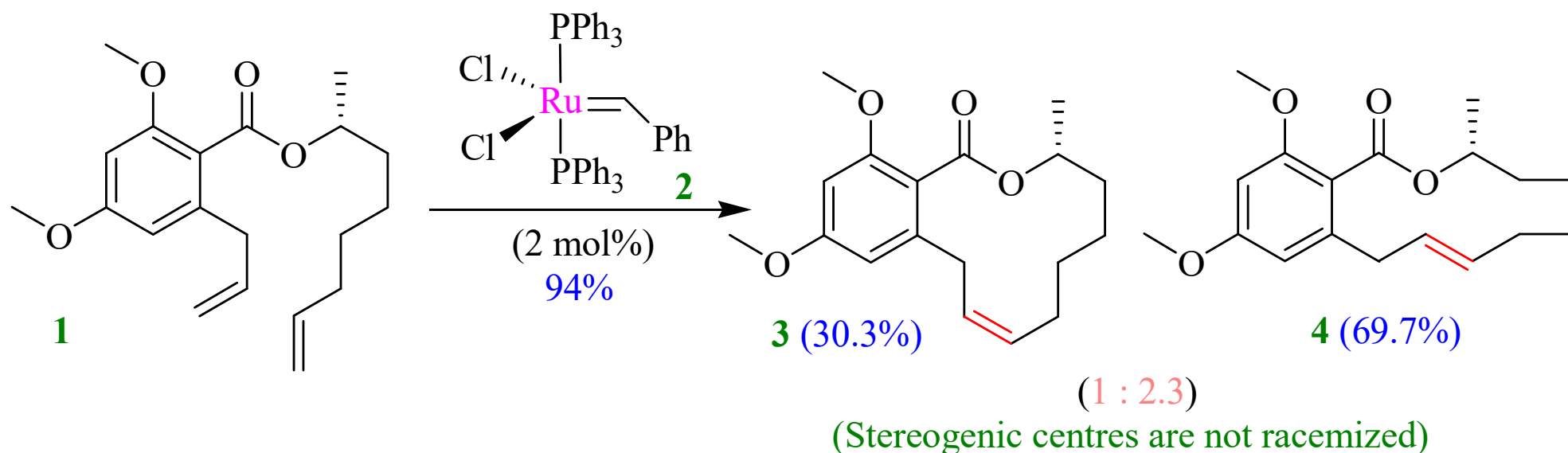
Applications of OrganoRu



Applications of Intermolecular OrganoRu

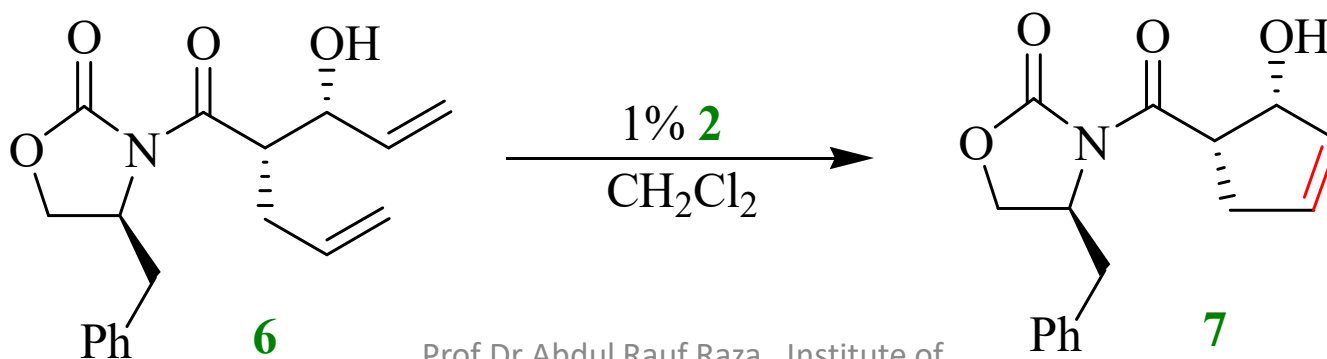
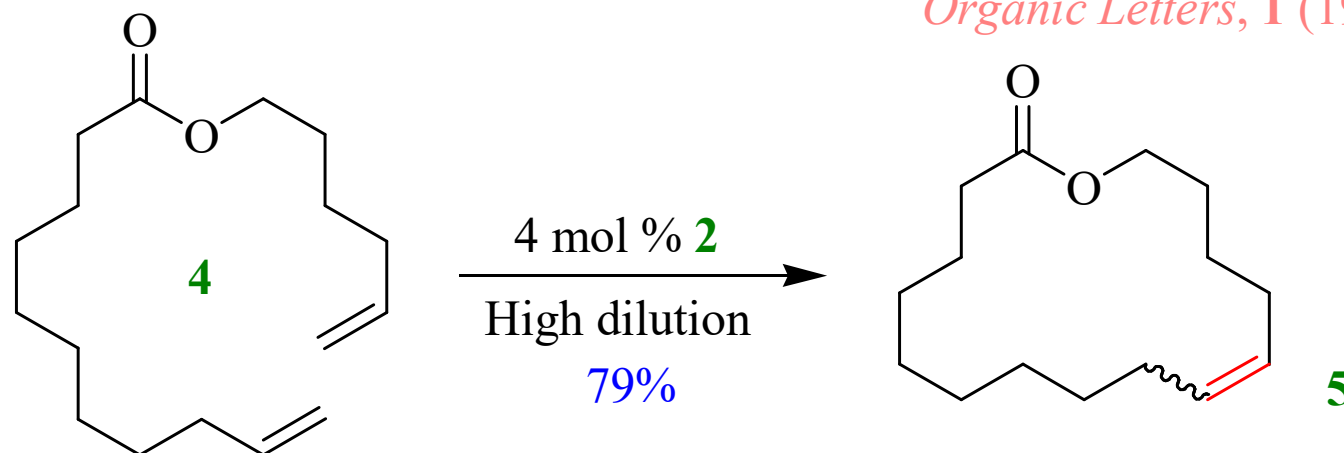
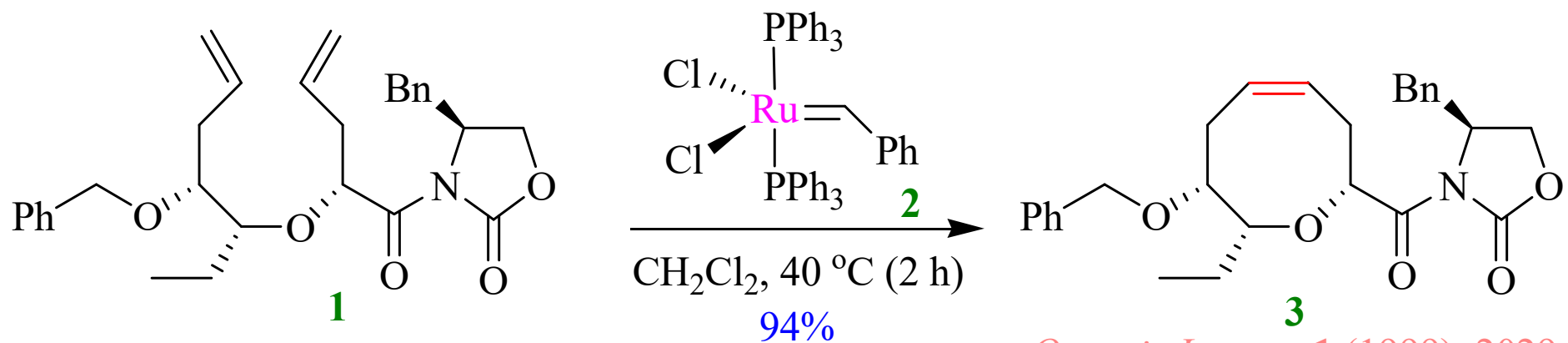


Applications of OrganoRu

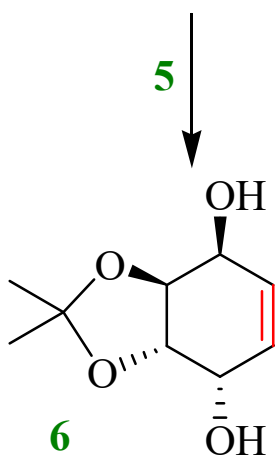
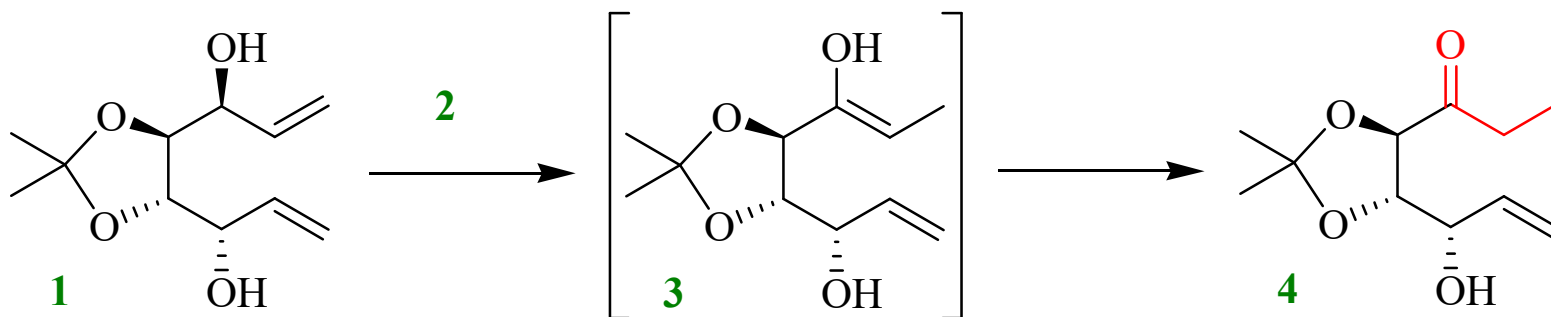


J. Am. Chem. Soc., 121 (1999), 5653

Applications of OrganoRu



Applications of OrganoRu



Tetrahedron, **56** (2000), 2195

