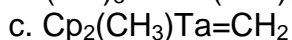
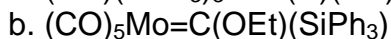
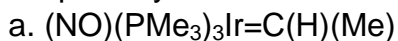
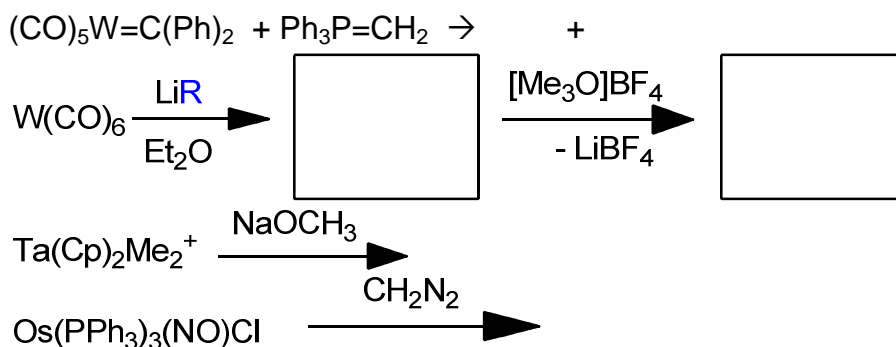


T3. OMCh Problems

1 Propose synthetic routes to the following carbene complexes:



2 Predict the products in the following reactions:

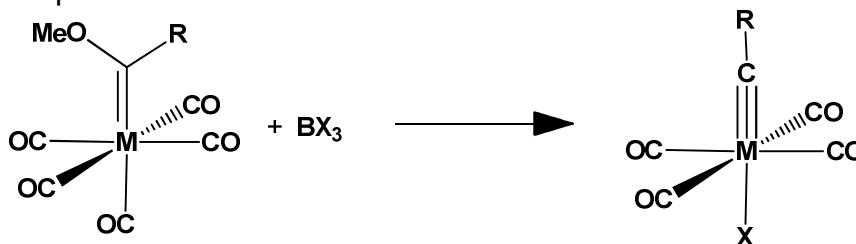


3 The geometrical parameters for some $\text{X}(\text{CO})_4\text{M}\equiv\text{C}-\text{R}$ as displayed in the table. Explain the difference in bond lengths.

Refcode	M	R	M-C	X	M-X	M-CO	M-C-R	C-M-X
CATYOL	Cr	CH ₃	1.710	Cl	2.442	1.92-1.99	179.3	178.9
CLCBCR	Cr	Ph	1.676	Cl	2.401	1.906	180	180
BRCBCR	Cr	Ph	1.667	Br	2.567	1.934	180	180
BCPCBC	Cr	CF ₃ -Ph	1.678	Br	2.563	1.84-1.96	171.3	177.8
MCBCCR	Cr	C ₁₀ H ₁₈	1.666	Br	2.562	1.92-1.97	173.6	176.3
CPCBCR	Cr	Cyclo-C ₅ H ₇	1.652	I	2.781	1.91-1.95	175.7	178.2
BMCBCW	W	CH ₃	1.818	Br	2.648	2.10-2.14	178.3	176.8
IMCBCW	W	CH ₃	1.775	I	2.867	2.029	180	180
DADKUO	Cr	N(C ₃ H ₇) ₂	1.745	Cl	2.412	1.91-1.94	177.4	178.7

4 Describe the molecular structure of $\text{TaCp}_2(\text{CH}_2)(\text{CH}_3)$

5 Propose a mechanism for the reaction:



Additional problems

Crabtree, *The Organometallic Chemistry of Transition Metals*, 4 ed, Wiley, Hoboken, 2005. Chap. 11: 1, 3.

Douglas, McDaniel, Alexander, *Concepts and Models of Inorganic Chemistry*, Wiley, New York, 1994. 12.24.

Miessler, Tarr, *Inorganic Chemistry*, Prentice Hall, Englewood Cliffs, 1991. 12.29.