

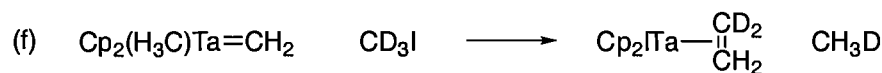
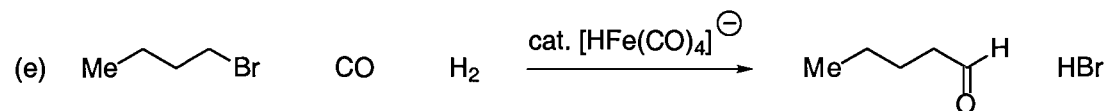
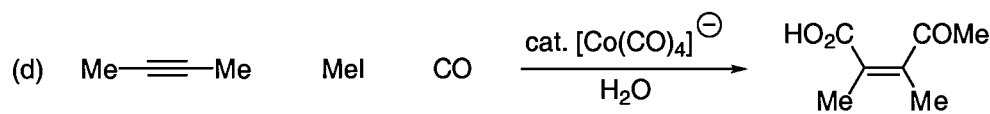
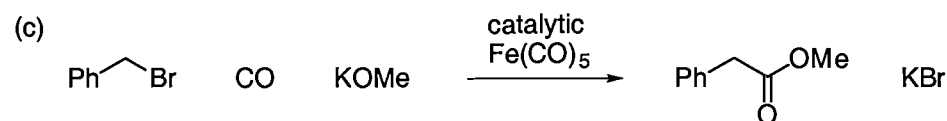
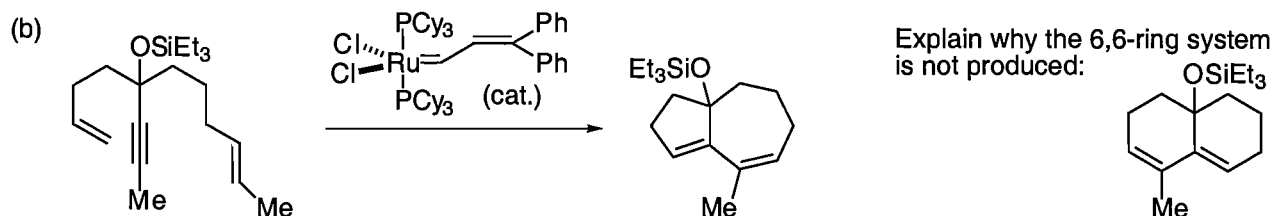
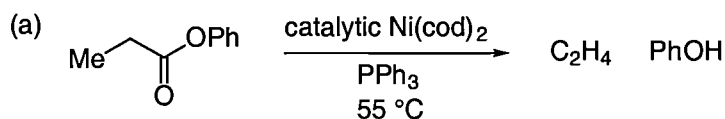
Massachusetts Institute of Technology

5.44: Organometallic Chemistry

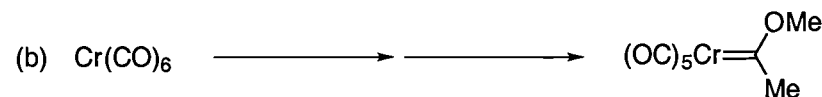
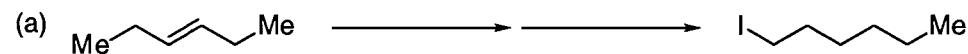
Problem Set 3

Due: Friday, December 3, 2004 by 5 PM

(1) Provide a mechanism for each of the following reactions. Please name each elementary step (e.g., oxidative addition, reductive elimination...).



(2) Provide reagents to accomplish the illustrated transformations. One, two, or three steps may be required.



(3) The rate of carbonylation of 2-propanol to give 2-methylpropanoic acid is seven times faster than the carbonylation of 1-propanol to give butanoic acid (Monsanto acetic acid-type process). If oxidative addition is the rate-determining step in the catalytic cycle, what can be said about the mechanism of oxidative addition when 2-propanol is the starting material?