

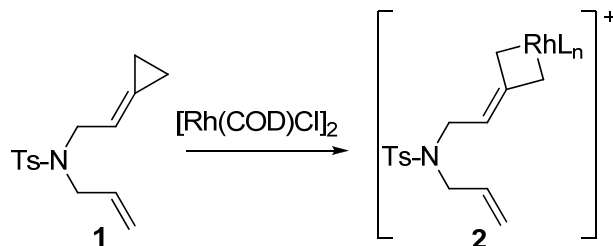
Organometallic Chemistry

Name: _____

Problem Set #4

Due: Oct. 28, 2008

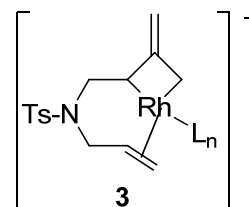
1. The following mechanistic step was recently reported in the literature to explain a new reaction.



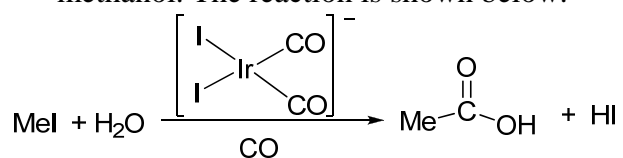
a) What type of reaction is occurring? Support your answer with a brief explanation. (Note: the authors did not indicate the number of L's on Rh in the intermediate, but assume there are 4, i.e. $n=4$.) (4 pts.)

b) It is unusual for this type of reaction to occur with C-C bonds. Explain why this molecule might be special and therefore allows this type of reaction to occur in this case. (4 pts.)

c) The authors propose that compound **2** in question 1 undergoes rearrangement to compound **3** (below). Briefly explain what has happened to **2** in becoming compound **3**. (4 pts.)



2. The Cativa process is now the most common industrial way to generate acetic acid from methanol. The reaction is shown below.



Suggest a catalytic cycle that performs this transformation. The catalytic cycle should combine three fundamental reaction types. Identify each step by its reaction type. The fourth and final step (which is not technically part of the catalytic cycle) is the hydrolysis of an acyl halide. (8 pts.)