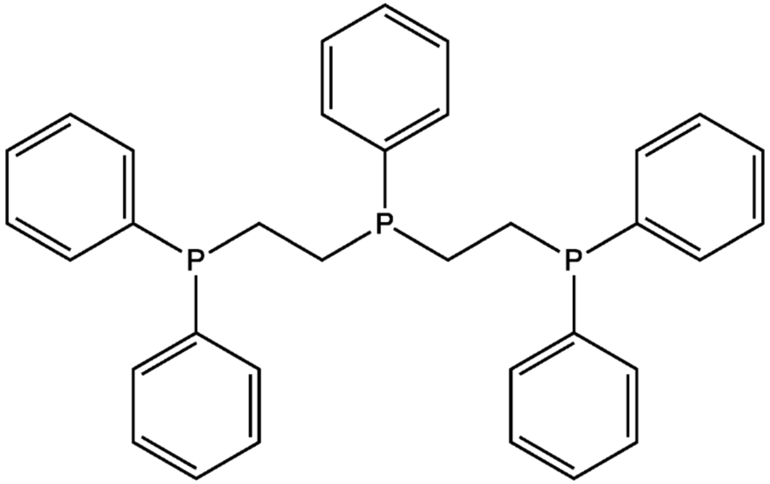
Would you expect Rh(triphos)Cl to be a hydrogenation catalyst for alkenes? Why? If not, how can you turn it into one?

Triphos



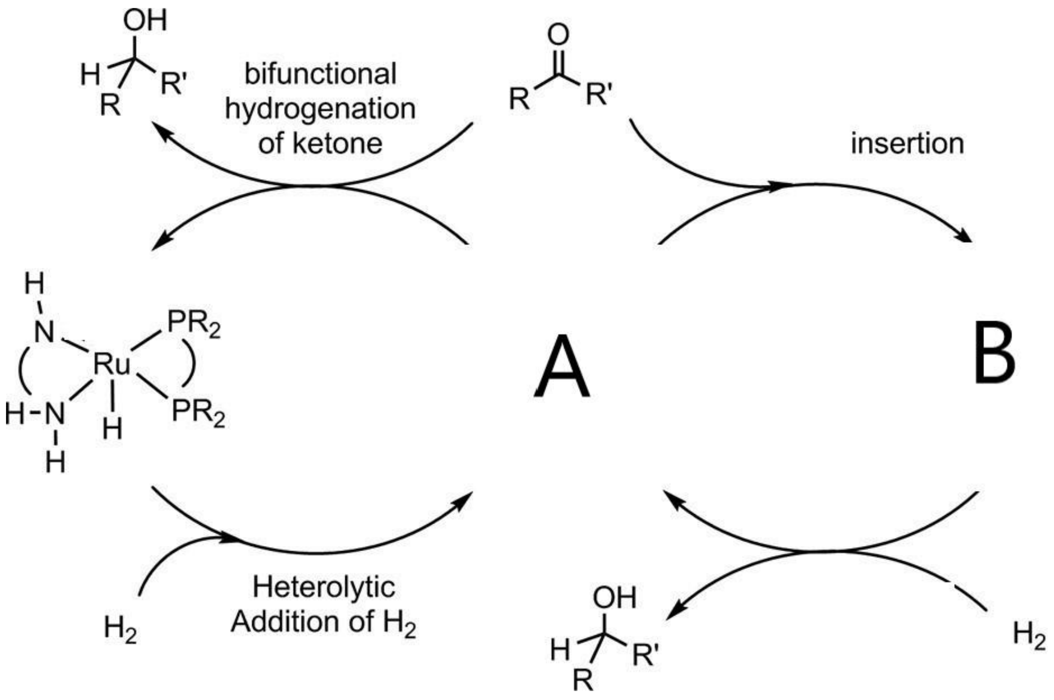
Answers for previous slide:

Rh(triphos)Cl is expected not to be a good catalyst because there is no open coordination site.

To turn it into an active catalyst, we should remove the Cl ligand, for example, by reacting with a silver salt.

For the following Ru-catalyzed hydrogenation. Two possible mechanisms are known: a bifunctional mechanism and a step-wise mechanism. Please complete the following questions.

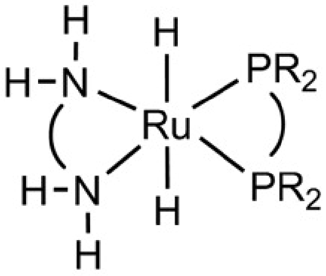
1. What is the oxidation state of the Ru catalyst in the left.
2. Draw the structure of intermediates A and B
3. What is the oxidation state of Ru in A and B?



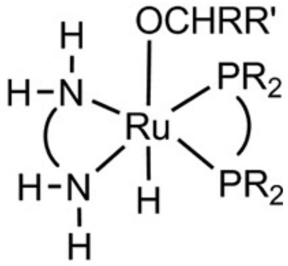
(1) What is the oxidation state of the Ru catalyst in the left.

+2

(2)



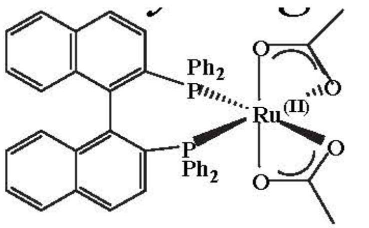
A



B

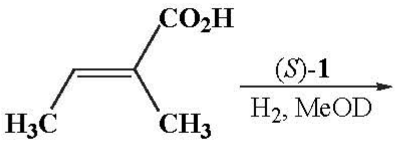
(3) +2

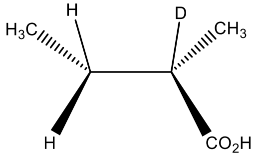
For the following hydrogenation reaction, what do you expect as the main product? Why?



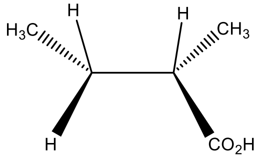
1

Reactions in MeOD

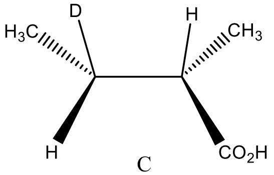




A



B



C

It should be C. Because H2 is heterolytically split; in MeOD, the proton would exchange with MeOD. As there is a huge excess of MeOD relative to H2, the majority of atom at the b-position to the COOH group would be D.