

Reading guide and suggested problems for Chapter 14

Chapter 14: Organometallic Reactions and Catalysis. Chapter 14 discusses the reactions that can occur in organometallic complexes and how organometallic complexes are used in catalytic cycles. You will be expected to identify individual reaction steps, as well as identify metal oxidation state and metal complex electron count in the various reactions. You will NOT be expected to memorize any catalytic cycles.

Learning goals:

- 1) Learn the basic reactions that can occur at an organometallic center.
- 2) Be able to predict products or reactants of a reaction given the reaction type it is classified as.
- 2) Be able to identify basic organometallic reactions within the context of a catalytic cycle.

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Suggested reading

14.1, 14.1.1, 14.1.2, 14.1.3, 14.1.4. These sections describe reactions that involve a gain or loss of ligands at a metal center. You are responsible for all of the reaction types described.

14.2, 14.2.1, 14.2.2, 14.2.3, 14.2.4, 14.2.5: These sections describe reactions involving modification of ligands. You are responsible for all of the reaction types described.

14.3, 14.3.1, 14.3.2, 14.3.3, 14.3.4, 14.3.5: These sections describe organometallic catalysts and several catalytic cycles. I suggest you look at all these cycles and 1) be able to identify what specific reaction is happening at each step (according to the reactions covered in previous sections) and 2) be able to determine metal oxidation state, and metal complex electron count for each of the organometallic species in the cycle. You will NOT be expected to memorize catalyst structures or catalytic cycles for the final exam.

14.3.6: I may discuss olefin metathesis in class (time permitting), but it will not be covered by the exam. Read if you are interested!

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Relevant homework problems:

14.1, 14.2, 14.3, 14.8, 14.9, 14.14, 14.15

Go through each catalytic cycle presented in this chapter!