Papers and textbook chapters used in fall 2016

For this year, based on feedback from prior years, we spent the first part of the course doing faculty-led presentations on the George Stanley textbook (https://www.ionicviper.org/collection/george-stanley-organometallics), and then finished up with papers derived from the VIPEr faculty development workshop on Organometallics during summer 2016 at the University of Michigan. There were only 5 students enrolled, which made discussion DIFFICULT. I ended up creating LOs for the Jones/Feher and Goldberg papers, during the course, and posted them after it was over. An LO for Kubas was developed during the semester too!

The class met once per week for 75 minutes.

Week 1: course intro, historical aspects, the story of ferrocene, counting electrons (CBC method), Stanley Ch 1

Week 2: MO theory for organometallics

Week 3: CO, ethylene, Stanley Ch 4, 5.1, 5.2

Week 4: carbenes and carbynes, Stanley Ch 6.1-6.3

Week 5: OA/RE, Stanley Ch 7.2, 7.3

Week 6: insertion/elimination, Stanley Ch 8.1

Week 7: Nicole M. Camasso and Melanie S. Sanford *Science* **2015**, *347*, 1218-1220. DOI: 10.1126/science.aaa4526. (<https://www.ionicviper.org/literature-discussion/literature-discussion-%E2%80%9Cdesign-synthesis-and-carbon-heteroatom-coupling>)

Week 8: Jones & Feher, “Isotope Effects in Arene C-H Bond Activation by [(C5Me5)Rh(PMe3)]” *JACS*, **1986**, *108*, 4814. (<https://www.ionicviper.org/literature-discussion/isotope-effects-arene-c-h-bond-activation-cprhpme3>)

Week 9: Comparison of the Electronic Properties of Diarylamido-Based PNZ Pincer Ligands: Redox Activity at the Ligand and Donor Ability Toward the Metal

Jillian J. Davidson, Jessica C. DeMott, Christos Douvris, Claudia M. Fafard, Nattamai Bhuvanesh, Chun-Hsing Chen, David E. Herbert, Chun-I Lee, Billy J. McCulloch, Bruce M. Foxman, and Oleg V. Ozerov, *Inorg. Chem.*, **2015**, *54*, 2916–2935. DOI: 10.1021/ic503062w (<https://www.ionicviper.org/literature-discussion/electrochemical-and-carbonyl-frequencies-explain-ligand-non-innocence>)

Week 10: Kubas, *et al.* “Characterization of the First Examples of Isolable Molecular Hydrogen Complexes … Evidence for a Side-on Bonded H2 Ligand” *JACS*, **1984**, *106*, 451. (<https://www.ionicviper.org/literature-discussion/molecular-hydrogen-complexes-mo-and-w>)

Week 11: “Synthesis and Reactivity of Oxorhenium(V) Methyl, Benzyl, and Phenyl Complexes with CO; Implications for a Unique Mechanism for Migratory Insertion,” Robbins, LK; Lilly, CP; Smeltz, JL; Boyle, PD; Ison, EA;, *Organometallics* **2015**, *34*, 3152-3158 (<https://www.ionicviper.org/literature-discussion/oxorheniumv-methyl-benzyl-and-phenyl-complexes-new-mechanism-carbonyl>)

Week 12: Karen Goldberg, *et. al.* J. Am. Chem. Soc.***,* 1995**, 117, 6889-6896. (<https://www.ionicviper.org/literature-discussion/energetics-and-mechanisms-reductive-elimination-ptiv>)

Week 13: “A Proton-Switchable Bifunctional Ruthenium Complex That Catalyzes Nitrile Hydroboration,” Geri, J. B., and Szymczak, N. K.; J. Am. Chem. Soc., **2015**, 137, 12808-12814. (<https://www.ionicviper.org/literature-discussion/zones-catalysis-only-metal-literature-discussion-outer-sphere-hydroboration>)

Final exam was an in-class oral exam on a paper by Legzdins: “Functionalization of Methane Initiated by Cp\*W(NO)(CH2CMe3)(η3-CH2CHCMe2),” Rhett A. Baillie, Brian O. Patrick, Peter Legzdins, and Devon C. Rosenfeld, *Organometallics*, 2017, 36 (1), pp 26–38. (<https://www.ionicviper.org/literature-discussion/methane-activation-tungsten-allyl>)