

**Chem 348 ‘Write Your Own Final’  
Thursday, Noon, May 16**

This is the last assignment. In keeping with College policy, it will be due after Reading Week, but you are welcome to turn it in before the due date if that makes you feel better.

### Overview

‘Write Your Own Final’ is an opportunity for you to demonstrate what you have learned and also what you think your classmates should have learned from taking this class. Here is what you will do:

1. Write a final exam suitable for a two-hour take-home exam
2. Write an answer key for the exam (provide literature refs where necessary, see below)
3. Turn the exam and answer key in as a single PDF file

### Instructions

#### 1. Write a final exam

Several considerations go into writing an exam. Material & length – what topics should be covered and how many questions should one ask given the time constraints?

Takeability/gradeability – multiple choice exams are easy to grade, essay exams are the hardest; feel free to include problems of different types. Student diversity – different students invest different amounts of time in the course (and even in individual course topics). How does one construct an exam that will allow every hard-working student an adequate opportunity to shine?

**Material.** The exam must touch on three of the following four topics:

- technical nomenclature that every organometallic chemist needs to know
- electron counting
- metal-ligand bonding models/MO theory
- recognizing reaction types

It goes without saying that you should sample these topics without exhausting them. Because of the limited length of the exam (see below), some problems can be much shorter than others. Problems normally vary in length, style, and difficulty. Be guided by the style of exam problems you have seen, but write your own.<sup>1</sup>

---

<sup>1</sup> All exam material must be generated independently. Your problem can imitate the style of a problem seen elsewhere, e.g., in the book, but make sure that you compose the content of each problem on your own. Do not share problems with classmates.

Your exam must also include two questions based on the student-led paper discussions. One must be based on the paper that you led the discussion for. The other must be based on a different paper.

Finally, include one question that addresses one more topic (not listed above) that you personally feel has been important in this class. Because this is a final exam, you can choose a topic from anywhere during the semester, but it should be something that we covered.

**Duration.** Assume that the exam is 90 minutes long and is take-home. This means that you can make the exam open/closed book, notes, journal article, internet, to whatever extent you wish. Reed has an Honor Principle so don't hesitate to rely on that as a constraint on student behavior.

When thinking about problem difficulty and the exam time, assume that answers will occur fairly quickly to a really well-prepared student, but it will still take time to write them out (multiple choice, true-or-false, etc., go very fast; try not to overuse these). This not-so-imaginary well-prepared student should probably finish the exam early (after 75 minutes?) and still have time to look over all of the answers and make corrections.

Consider other students too. Try to make some of the exam sufficiently straightforward that an attentive, but not-so-hardworking student could certainly hope to score at least 50% and perhaps earn enough partial credit on trickier problems to end up with 65-75%.

Number the problems. Assign points to them. Total points should add to 200.

## 2. Write an answer key

Write the answer key in a format that you would post online for students.

A good answer key should provide a straightforward answer for some simple problems and more of an explanation for others. This means that you should "show the work" of reaching an answer, but not necessarily trace every detail back to its roots. For example, in giving the answer for an electron-counting problem, you might say that Ti is a  $d^4$  metal (that should be common knowledge to every well-prepared student in the class), but you shouldn't include Ti's atomic number or full electron configuration because that's going too far.

If an answer relies on information that appears in a journal article, please cite the article so that I can check the information myself.

You do not have to explain how you will grade the problems, but please mark (in the answer key) which problems are "easy" and which ones are doable, but "more difficult". As explained above, close to 50% of the exam points should come from "easy" problems, but not too much more than that.