MEMORANDUM

TO: Gang of Four
FROM: Chairman Ron
SUBJ: Exams are Due on 26/How Did We Get in this Fix?

Exam I is a masterpiece! But don't believe me - when you see it next Thursday, you'll stare at it in open-mouthed astonishment, unable to find the words to express exactly how you feel. Now that's how I define a masterpiece.

Covered are electrocyclic reactions (theory and experiments, Handouts I - III) and cycloadditions (theory and experiments, Handouts IV and V, but not including the polar [2+2] reactions on pp 7 - 14c of Handout V).

My time in answering the exam was 90 minutes, about the same as for a Chem. 550 exam. (Of course the careful computer drawings that you'll see on the answer sheet took much longer - much much much longer.) I'm giving you 12 days (in contrast to the five days for Chem. 550) because this material is more difficult and because I want to be sure that you have enough time to think through the answers. It's obvious, but I'll say it anyway: it would be a tragic error to wait until February 25 before beginning the exam.

Several problems are the type that have no set answer. Instead, I may ask you to design an experiment to decide between rival mechanisms or I may ask you to speculate on the nature of some seemingly unfamiliar processes. As was true in Chem. 550, you must have faith that nothing on your exam lies outside the range of ideas developed in lecture. Thus, there is no need for you to invent new chemistry (in fact there is an unwritten, but enforced, restriction against this) in the course of writing out your answers.

In Chem. 550, I take "pride" in finding literature examples that are not more than one year old. I've not been so virtuous with your exam (although there is a reference to work published in 2001) but that's OK. I rationalized it this way: not having taught the course since spring semester 1990, I consider everything from summer 1990 onward to be "new"! (And, in fact, I have only one reference from an earlier date.) As was true in Chem. 550, copies of the literature reprints that I used to formulate the questions will be available, but only after February 26, to the first person who asks for them. Also as was true in Chem. 550, the list of references will be withheld from you until after the exams have been turned in.

Because this is a 600-level course, you get four quotations on the exam! For Exam I, we are honored to have the words of Nobel Laureates John Steinbeck and Albert Einstein, along with a 19th century French mathematician named August Comte. It is with great sadness that I must report that the fourth quotation is by Richard M Nixon.

The practice exam from 1990 is exactly that - something for you to practice on, to see how well you are understanding the material. It's a mistake to look at the answers to the old exam before you've finished your studying and before you've attempted to answer the questions. If you've not yet availed yourself of the opportunity, you should plan on borrowing copies of the old exams and the answers for photocopying. Also available for photocopying are the answers to the exercises assigned in class.
The rules for the two exams in Chem. 650 are similar to those from Chem. 550. They are shown here (and also at the top of each exam).

**ORBITAL SYMMETRY (COURSE) SELECTION RULES:**

**ALLOWED PROCESSES:** You may consult: your class notes, handouts, and problem sets; the textbook for this course; the 1990 exam and answers; and any of the standard textbooks on orbital symmetry (listed on pp. 3-5 of *Books and Review Articles*). You should also feel free to consult me when you run into difficulties; although I will not "give away" any answers, I will try to guide you to find the solution on your own. Once the exam has been distributed, I will only answer questions related to it; I will no longer answer questions on study materials.

**FORBIDDEN PROCESSES:** You may not search the primary literature (syllabus) or secondary review literature (pp. 5-46 of *Books and Review Articles*) for answers to your questions, nor may you seek assistance from classmates, other students, faculty (except for "yr obdt srvt"), faith healers, or anyone else, living or dead, real or imaginary.

You'll be writing your answers in blue examination books. There is absolutely no need for you to work out the answers on scratch paper before transcribing them into the blue books. This is an exam, not a term paper; as such, it doesn't matter if there are erasures, cross-outs, etc. I'll give you three blue books at the start, but if you find yourself succumbing to a bout of logorrhea (look it up!) I'll provide extra books. At least one of the people auditing the course plans to take the exam and turn the answers in. (Foolish lad - he actually thinks that I'm going to waste my time reading and grading his work!) If others who are not taking the course for credit also want to take the exam, let me know ahead of time so that I can provide you with blue books. (But as for whether or not I'll grade your work ....)

There are a mere three questions on the exam, each having some \(6.02 \times 10^{23}\) parts. The total 200 points is broken down like this:

I. (90 points) Electroyclic and cycloaddition reactions: theory (including the "opportunity" of constructing your very own orbital correlation and electronic state correlation diagrams); experimental work on neutral and ionic electrocyclic processes; speculation on what can occur and what is unlikely.

II. (40 points) Some *spectacular* examples of electrocyclic reactions and cycloadditions from the worlds of organic synthesis and organic reaction mechanisms; one drawing, in fact, is so complex that it took me days to assemble it. OK, so I exaggerate a bit.

III. (70 points) Cycloadditions ... and more cycloadditions ... and still more. You'll laugh, you'll cry, you'll wonder why you even considered taking this course. But trust me, boys and girls, years from now you will appreciate the mind-stretching experience afforded by Question III.