

Preview Sheet for Test 4
Electrochemistry
Wednesday, April 19, starting at 8:00 a.m.

- Lectures from 3/27 to 4/12
- Problem Sets 6 (the problems from IMT Chapter 11), 7 and 8--see course web page for answer keys)
- Reading
 - IMT Chapter 13: Pages 13-8 to 13-21
 - Silberberg Chapter 4: Pages 150 to 155, 161 to 163
 - Silberberg Chapter 21: Pages 903 to 928
- Test Format
 - Calculations: 40 points
 - Balancing chemical equations: 25 points (write the hydrogen ion as H_3O^+)
 - Shorter and longer essay questions: 35 points

Studying strategies:

- Focus on your lecture notes and homework. Use your textbooks only as a reference.
- Make sure you understand the significance and use of the reference information that will be given to you in the back of the test booklet (see back).
- Do extra problems at the ends of the chapters. If you would like to look up an answer for a problem, please see the answer keys on the bulletin board next to Prof. Fischer's office.
- It is also important to understand concepts from lecture not covered explicitly in the homework problems. These may be covered by the essay questions.
- If a topic was not covered in homework or in lecture, you are not responsible for it! Please e-mail me if you cannot figure out if a particular topic is "fair game" for the test.

Student Tutoring Schedule (in Olin-Rice 341)

Sunday: 1:00 – 10:00 p.m.

Monday - Thursday: 7:00 – 10:00 p.m.

Extra Office Hours
This Tuesday: 6:30 – 8:00 p.m.

[Instructions from the test booklet:]

1. Your exam booklet should have **eight** pages total, with questions on Pages 2-5, and a periodic table and other reference data on Pages 6-8. Check to see you have eight pages now. If you do not, ask for another copy of the exam.
2. Write your name in the space above and on the backs of Pages 2-5.
3. This exam is closed-everything.
4. You may use programmable calculators, but chemical data should not be stored in them.
5. You have up to **90 minutes** to work on this exam, if you start work at 8:00 a.m.

What not to memorize (they will be provided):

- (1) A periodic table
- (2) Silberberg Appendix D
- (3) The information below:

$$T(\text{K}) = T(^{\circ}\text{C}) + 273.15 \quad T(^{\circ}\text{F}) = 1.800T(^{\circ}\text{C}) + 32.00$$

$$\Delta H = \Delta U + P\Delta V \quad \Delta S = \Delta S^{\circ} - R \ln Q \quad \Delta G = \Delta H - T\Delta S$$

$$\Delta G = \Delta G^{\circ} + RT \ln Q \quad \Delta G^{\circ} = -RT \ln K \quad \ln \frac{K_2}{K_1} = -\frac{\Delta H^{\circ}}{R} \left(\frac{1}{T_2} - \frac{1}{T_1} \right)$$

$$\Delta G = -nFE_{\text{cell}} \quad \Delta G^{\circ} = -nFE_{\text{cell}}^{\circ} \quad E_{\text{cell}} = E_{\text{cell}}^{\circ} - \frac{RT}{nF} \ln Q$$

$$E_{\text{cell}}^{\circ} = E_{\text{cathode}}^{\circ} - E_{\text{anode}}^{\circ} = E_{\text{red}}^{\circ} + E_{\text{ox}}^{\circ}$$

$$F = 96485 \text{ C mol}^{-1} \quad R = 8.315 \text{ J mol}^{-1} \text{ K}^{-1}$$

$$N_{\text{A}} = 6.022 \times 10^{23} \text{ mol}^{-1} \quad 1 \text{ kJ} = 10^3 \text{ J}$$

Test-Taking Tips

- Show up at 8:00 a.m.! You should always give yourself as much time as possible to work on an exam.
- Pace yourself. Try to make your effort on a given problem proportional to the number of points that it is worth.
- Read the problems carefully.
- If you can't figure out how to begin a problem after thinking about it for a couple of minutes, go on to the next problem.
- Please ask me if you do not understand what a question is asking for.