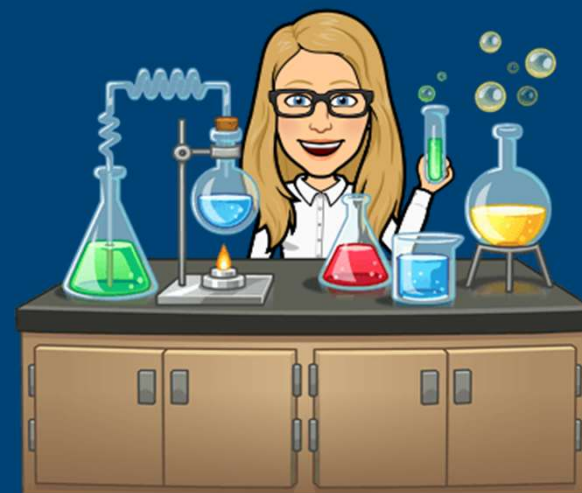


For voting, go to: <https://pollev.com/lauriestarke263>
or text LAURIESTARKE263 to 37607 to join poll



Dr. Laurie S. Starkey
Cal Poly Pomona

CHM 3140 Organic Chemistry I
Announcements 2/6/25

Today's Topic: Acid-Base Chemistry aka Proton-Transfer Reactions (Chapter 3, Step 2)

Chapter 3

✓ Watch

✓ Read

✓ Practice

Daily To-Do

Flipped Lectures

Step 2

- Read Klein sections 3.3, 3.6, 3.8-3.10
- Watch flipped lecture
- Work through SkillBuilders 3.2-3.4, 3.6, 3.9-3.11
- Compare Acid Strength [homework](#) (in Gradescope - can be submitted late with no penalty, up until date of Exam 1)
- Work on suggested [Chapter 3 EOC problems](#) on WileyPLUS (auto-graded) and/or on paper (self grade, using Solutions Manual).

[Part 2](#) - factors that affect acidity (resonance), identifying the strongest base, common acids/bases

31 minutes, *skeleton notes pages 3-5 to 3-7*

Flipped Lecture

Resonance Effects on Acidity	41:15
Small and Large Amount of Resonance	41:17
Acid-Base Example	43:10
Which is Most Acidic? Which is the Least Acidic?	43:12
Acid-Base Example	49:26
Which is the Stronger Base?	49:27
Acid-Base Example	53:58
Which is the Strongest Base?	53:59
Common Acids/Bases	60:45
Common Acids/Bases	60:46
Example: Determine the Direction of Equilibrium	64:51


**ARIO: Resonance effects,
predicting strength of bases &
identifying most acidic proton**



Why cats are not allowed in the operating room.

Finishing Exam 1 material

CHM 3140 Organic Chemistry I, Dr. Laurie S. Starkey, Spring 2025
Tentative Schedule (Chapter and *Worksheet/Step* # given for each day)

Week	Mon	Tues	Wed	Thurs	Fri
1	1/20	1/21 Ch. 1 #1	1/22	1/23 Ch. 1 #2	1/24
2	1/27	1/28 Ch. 1 #3 Ch. 2 #1	1/29	1/30 Ch. 2 #2	1/31
3	2/3	2/4 Ch. 3 #1	2/5	2/6 Ch. 3 #2	2/7
4	2/10	2/11 Exam Review	 You are here		2/14
				2/13 Exam I	

Chapter 3

Free Red Ink Homework

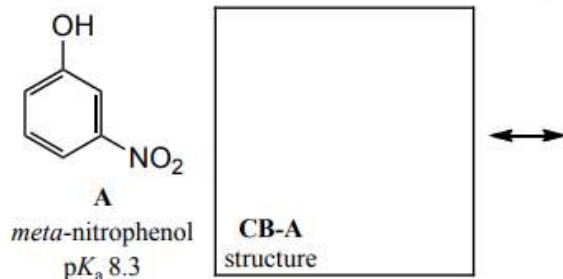
Organic Chemistry I, CHM 3140, Dr. Laurie S. Starkey, Cal Poly Pomona
Compare Acid Strength Homework

Name: _____ Section (day/time): _____

The nitro group (NO_2) is an electron-withdrawing group (EWG). The $\text{p}K_a$ for meta-nitrophenol (**A**) is 8.3 and the $\text{p}K_a$ for para-nitrophenol (**B**) is 7.1. Use this data to explain the effects of the nitro group on the acidity of phenol. **Resonance effects should be considered.** Use complete drawings to support your answer (i.e., draw out the nitro group and ALL relevant resonance forms of the conjugate bases).

Consider the following guiding questions as you prepare your explanation:

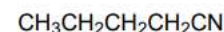
- 1) What is the relationship between $\text{p}K_a$ and acidity? Which is the stronger acid, A or B?
- 2) What do the conjugate bases of these phenols look like? (please refer to them as **CB-A** and **CB-B**)
- 3) Are the nitro groups involved in the resonance of CB-A and/or CB-B?
- 4) Which conjugate base is more stable? Why?



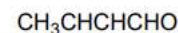
California State Polytechnic University, Pomona
 Organic Chemistry I, CHM 3140, Dr. Laurie S. Starkey
Lewis Structure and 3-D Sketch Homework

Name: _____ Section: _____ (day)

For each of the following compounds, draw a 3-dimensional sketch, using dashes and wedges to show the molecule such that the maximum number of atoms are located in the plane of the paper. Be sure to show all atoms (no line drawings), to draw pi bonds (with sets of overlapping p-orbitals), and include the orientation of lone pairs of electrons on oxygen and nitrogen.



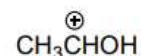
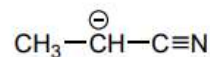
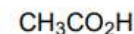
Chapter 1
Free Red Ink
Homework



Organic Chemistry I, CHM 3140, Dr. Laurie S. Starkey,
Lewis Structures & Resonance

Name: _____ Section: _____

For each of the following compounds, draw the important resonance forms. Be sure to show all structures. Use curved arrows to convert one drawing to the next. Indicate which are minor contributors, or whether they have the same importance, and be sure to show lone pairs. **NOTE: if a structure is charged then the goal is to find resonance structures spreading a charge among multiple atoms ("delocalizing" the charge) will score better.**



Chapter 2
Free Red Ink
Homework

Textbook Problems: Submit Cover Sheets to Gradescope

CHM 3140 Organic Chemistry I, Dr. Laurie S. Starkey, Cal Poly Pomona Ch. 3 (Klein): Acid-Base Reactions, End-of-Chapter Problems Cover Sheet

Name: _____ Signature: _____

By signing, you are confirming that the work you are submitting is your own.

Submit PDF to Gradescope. Please complete this cover page and include it as the first page of the pdf you submit. If you worked on paper, use Genius Scan (or equivalent app) to convert your hand-written homework to a clean, readable pdf. *Please crop your pages, apply a Black & White filter, and minimize the file size.*

Hand-written and/or WileyPLUS EOC Please mark the appropriate box below. **If you have worked on problems in WileyPLUS, please include a copy of your WileyPLUS gradebook with this coversheet.**

☐ hand-written only ☐ hand-written problems & WileyPLUS ☐ WileyPLUS only

**No Gradescope
Submission =
No Homework Credit!**

EOC problems (be sure to work on ***Mechanism** problems!)

37a-g	*44a-c	52
38a-h	*45a-d	53
39a-c	46ab	54
40a-c	47skip(d) & explain!	55

Acids in the News...



“Antibiotics are thought to promote animal growth by suppressing bacteria that consume nutrients in the gastrointestinal tracts of their hosts. But overuse of antibiotics can cause bacteria to become resistant—a danger to both animal and human populations.

Organic acids have been added to animal feed for decades to reduce bacteria growth and mold. When fed to animals in larger quantities, the acids disrupt the metabolic processes of gut bacteria without the accompanying risk of resistance, according to Fefana, a European feed ingredients association.”

With antibiotics increasingly being shunned as growth promoters, chemical makers are investing in short-chain organic acids as a new way to help farmers increase meat production without contributing to antimicrobial resistance.

The specialty chemical company Oxea just completed an expansion of its plant in Oberhausen, Germany, that boosts output of short-chain organic acids such as propionic acid, butyric acid, and isobutyric acid.

[+]Enlarge



Credit: Shutterstock

Organic acids are replacing antibiotics in animal feed formulas.

Examples of “Organic Acids” Propionic acid, Butyric acid, Isobutyric acid, Valeric acid