

CHE 2612 – Organic Chemistry Laboratory I Syllabus – Lab Experiments, Fall, 2010

	Dates	Experiment	Changes
1	Aug 25- 31	Check In, Safety Lecture, Lab policies & reports.	Monday, Aug 30, labs do MP experiment after check-in
2	Sept 1-7	1. Melting Points. [p 27-32; procedure p 29A-C]	Determine melting points & mixed mp of knowns and your assigned unknown.
3	Sept 8 - 14	2. Recrystallization. [p 33-42; procedure p 39-40]	Recrystallize 1 g of dirty benzoic acid from hot water. Then recrystallize unknown compound assigned and identify on basis of mp & mixture mp.]
4	Sept 15 - 21	3. Extraction. [p 69-82; procedure p 77-79]	You will separate one of 10 unknown mixtures using single base extraction & identify both components by MP-mixed MP
5	Sept 22 - 28	4. Distillation. (p 113-124; procedure p 115-6 & 123-4)	Work in pairs – one does simple, one does fractional – share boiling point/volume data; analyze first fraction by GC
6	Sept 29- Oct 5	5. TLC. [p 84-92; procedure p 117-118]	Use acetone as extracting solvent for spinach, then partition with pet ether. Wash with water only once. Use various petroleum ether-acetone mixtures as chromatography solvent
7	Oct 6 - 12	6. S _N 2 Rx. Synthesis of n-butyl acetate. [p 119-130; steam distillation, p 61-66; procedure p 149-152]	Carry out S _N 2 rx in aprotic polar solvent, use steam distillation to help isolate the product. Obtain the IR spectrum of your product.
8	Oct 13 - 19	7. Synthesis of 2-chloro-2-methylbutane [p 130-38; procedure p 133-4]	Do the silver nitrate and the sodium iodide tests.
9	Oct 20 - 26	8. Kinetics of solvolysis. [139-148; procedure p 145-47 & handout]	Use your own 2-chloro-2-methylbutane. You and your partner should use different solvent mixtures, share data and report data for both solvents. Titrate aliquots every 15 minutes.
10	Oct 27- Nov 2	9. Dehydration of cyclohexanol. [p 164-180; procedure p 169-171]	Use 85% H ₃ PO ₄ in place of H ₂ SO ₄ . Do the Baeyer and the bromine tests. Obtain the IR spectrum of your product (& cyclohexanol).
11	Nov 3- 9	10. Addition rx of alkenes; Bromination of trans-cinnamic acid. [p 180-196; procedure p 215-19]	You will brominate cinnamic acid rather than stilbene, recrystallize & determine MP and stereochemistry of addition process.
12	Nov 10- 16	11. NMR & IR of Unknown A [p 221]	In-lab handout assignment on NMR interpretation; each student runs IR & NMR to identify their unknown from Unknown A list
13	Nov 17- 23	12. NMR and IR of Unknown B [p 223]	Each student runs IR & NMR to identify their unknown from Unknown B list. Checkout after experiment

Course Coordinator: Dr. Michael Kurz, BSE 1.340 phone: 458-7052

Office hrs: MW: 9:30-10:30; W: 1:30-4 PM; F 1-2 PM; Other times by appointment

CHE 2612 – Organic Chemistry Laboratory I
Syllabus – Lab Lecture, Fall, 2010
For use with Gilbert, Martin & Hansen (blue spiral)

Dates*	Lab Lecture	Pages to Read
Aug 25	Orientation, lab reports; safety, melting points	1-16, 17-25
Sept 1	Melting points /Recrystallization	27-32
Sept 8	Recrystallization	33-42
Sept 15	Extraction	69-82
Sept 22	Distillation; Chromatography; GC	43-61, 83-4, 100-116
Sept 29	TLC, IR spectroscopy	117-18; 84-92, Smith, Chap 13
Oct 6	Substitution reactions (S_N2 synthesis of n-butyl acetate, S_N1 synthesis of 2-Chloro-2-methylbutane)	119-138 & 149-152
Oct 13	MidTerm Exam (Exp. 1-5)	
Oct 20	Kinetics of solvolysis	139-148
Oct 27	Dehydration of cyclohexanol	164-180
Nov 3	Bromination of trans-cinnamic acid; NMR (intro)	180-196, 215-19
Nov 10	NMR – 1 st Unknown	Smith, Chap 14
Nov 17	NMR/IR 2 nd Unknown, checkout	Smith, Chap 13, 14
Nov 24	Final Exam (cumulative; focus on Exp. 6-12)	

Exercises

These exercises from the lab text illustrate the kinds of knowledge you should be learning in this course.

Experiment	Pages	Exercises
Melting Points		
Recrystallization	42	Pre-lab p 42
Extraction	81-2	p 81, pre-lab, p 82
Distillation	59	1, 2, 3, 4, 8, 9, 11(a), 14(a,b,c)
TLC	92	2,3,4,7
n-butyl acetate	128	13, 14
2-Chloro-2-methylbutane	135-7	1, 3, 4, 5, 6, 14(a), 16(IR only)
Kinetics	145-7	1-3, 8
Dehydration	171-5	1-5, 8, 29a, 30a
Br ₂ addition	194	1-3, 6-8
NMR*		

*After NMR lecture, you should be able to go back and answer NMR Exercises of previous experiments.

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