

# ORGANIC CHEMISTRY II PROBLEMS, USING WADE + SIMEK 10<sup>th</sup> Global Edition

- Organic Chemistry (10th Global Edition) by Leroy G. Wade and Jan William Simek. Published by Pearson.
- General Pearson link: <https://www.pearson.com/en-us.html>
- Pearson textbook: <https://www.pearson.com/en-us/subject-catalog/p/organic-chemistry/P200000007007/9780135213728>
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Chapter Topic	Wade Chap	Wade 9 Problems In the Chapter	Wade 9 Problems Back of the Chapter
<b>Intro, Structure and Bonding</b>	1	2a-h, 3a-h, 4, 5a-c, 6(omit boron ones), 7a-e, 8a,b, g, 9a, d, 11, 12, 15b, 16, 17, 18, 19, 22, 24a,b, 25	29a-g (ionic or not), 31a-e, 32, 33, 35, 37 (ID lone-pairs, and #-of-attached-hydrogens), 41a,b,d,e,g, 42a,b,d, 43a,c, 44a,b,e, 58a,c,e 59a-f  23, 25-29, 31, 34, 35.1, 36, 37, 40-43, (for 42 and 43, you should be able to process H <sub>2</sub> SO <sub>4</sub> by memory, the others by structure without needing to look at a list of acidity values), 45 (use nucleophile/electrophile designation, and definitely practice the arrow pushing), 46, 47a,b,d
<b>Acids, Based, Functional Groups</b>	2	5, 6b,c,d,e, 7, 13a,e, 24 (ignore the "cyclo" part), 25, 26(skip d,f), 27 (skip h),	31 (ignore the solubility-in-water prediction part), 32a-e, 33, 35a,b,e, 36(b,c,d only), 37(ignore HF), 38(ignore first two), 41a-c, 42a,c,f, 45a, 46a, 47a, 49, 55a-l, 56a-f, 57(ignore sulfide)
<b>Alkanes</b>	3	1a, 2a, 3, 4a-e, 5, 6a,b, 7a,b, 9a, 12, 16a,d,e, 17, 18, 25-27, 29	34, 35, 36(omit c and d), 37 (omit b), 39 (omit e,g,h), 41, 42b, 44, 45a,b, 46, 48, 51
<b>Chemical Reactions.</b>	4	1a-c, 2, 4a, 9a, 11-13, 18, 19a-d, 24, 25, 28-32.	34-37, 40, 42-45, 47a,b,e
<b>Stereo chemistry</b>	5	2 (label as chiral or achiral. If chiral, also draw the enantiomer.), 3 (star chiral C's, identify each chiral molecule, and be able to draw the enantiomers.), 4, 5 (assign as chiral or achiral), 6 [skip f,g. For all others, give the (R)/(S) designations.], 14, 20a-e, 21 (skip f), 22, 23c	25, 26a,c,d,j-p, 27, 30d, f-h 31a, f-i, 36
<b>Alkyl Halides: SN2, SN1, E2, E1 Reactions</b>	6	1, 2c,e,f, 3.1,3, 6, 7 (the density of chloroform is 1.50), 8a, 10 SN2 Reactions: 11-13, 14a,b,d,e, 15(skip b,g), 16, 18 (skip neopentyl bromide. And, substitution is more important than leaving group), 19a,b, 20(skip c,e,f), SN1 Reactions: 22, 23, 24, 25, 27, 29 (very interesting. Probably not test fodder.)	30, 31a,c-e, 32a,b,e,f, 33*, 32("solvolysis" is substitution by solvent, and is always S <sub>N</sub> 1), 35, 37-42, 45
<b>Alkenes</b>	7	1 (for b, counting geometric isomers, I count 14 possible alkene isomers and 15 possible cyclic isomers! The answer book only shows a few of the possibilities.), 4, 5a,b,c, 6a,d,e, 7a,e, 8a,c,e, 13b-d (more stable only. Skip the part about how much difference in energy), 16, 17a, 20a,b, 24, 25, 28, 29, 31, 32a, 33(skip f), 35a,b, 37	40, 41, 42a-c, 43a,b,d, 44 (for part c: how many rings does it have?), 49a, 50, 52a-c, 53, 56, 57, 58, 61a,
<b>Alkene Addition Reactions</b>	8	1-4, 6, 8-11, 13-20, 21a-d, 22 (for b, book answer is poor. Should use a hindered base), 23, 24, 29, 30 (mech for ring-opening only), 32b,d, 33, 34b-f, 35 (d,l means racemic mix of chiral products), 36, 37	46 (skip f, i, k,o; good practice for "predict the product" reactions.), 47a-l, 49, 50 (good synthesis design practice), 51 (skip e,g,i), 56a, b, c,e,f, 61
<b>Conjugate d Systems</b>	15	1, 2, 4, 5, 6, 7(skip c), 9, 10-11(NBS=Br <sub>2</sub> /hv), 12, 14, 15 (skip d), 16 (ignore stereochem), 18	24, 25a-d,g-i, 27, 30, 31, 33a-f
<b>Aromatics</b>	16	3(skip cyclooctatetraene), 5, 7b-d, 8, 12, 15, 16 (pyrrole picture on top of page, Fig 16.12), 17 (purine picture in section 16-9c), 19, 24a, c,e,g	26a-f, 27a-c,e,f, 28, 32, 34 (hint: N lone pairs are strongly basic when sp <sup>3</sup> or sp <sup>2</sup> but weakly basic when p), 35, 36, 37 ("xylene" means dimethyl benzene), 43
<b>Aromatic Reactions</b>	17	2, 3(p-xylene is 1,4-dimethylbenzene), 5, 6, 7, 8, 11, 12, 13, 14b(i-iv), 15a,c, 18, 19a, 20a-c, 43, 44, 46, 48	50a,b,d,f,h,j,l, 52a,b,e,f,g, 53b-f,h,i,j,l, 54, 57, 57, 64

## Schedule: Which Lecture Videos and Practice-Set Videos Go with Each Test

<b>Organic Chemistry 1, Jasperse, Based on Wade Version 9</b>		
<b>MSUM Videos</b>	Topic	Reading
<b>TEST 1 LECTURES</b>		
1	Intro. Why Carbon is Special, Normal bonding, Lewis Structures in Organic	1.1-1.6
2	1. Normal Bonding. 2. Formal Charge and Abnormal Bonding. 3. Electronegativity	1.7, 1.4-1.8
3	1. Structural formulas: Full, Condensed, and Skeletal 2. Resonance Structures	1.9-1.11
4	1. Mechanism/Arrow-pushing. 2. Acid-Base Chemistry. 3. Anion Stability Patterns.	2:4-7,12
5	VSEPR 3D Shape. Drawing 3D; Hybridization; Pi bonds; Isomers,	1:12-1-19
6	Polarity IMF, Boiling Points, Solubility. Catchup. Functional Groups	2.1-3
7	Functional Groups. Alkane Nomenclature	2.15-2.17
8	Alkane Nomenclature. Newman Projections; Torsional and Steric Strain; Cycloalkanes	3.1-3.9
9	Cyclohexane Chairs, Cis-and-Trans, Structural Isomers	3.9-3.16
10	Catchup/Practice. First 38 minutes of video 10. <b>Additional Practice Sets/Videos:</b> Mechanism Practice; Acid-Base Practice; 3D-Drawing Practice; Newman Projection Practice; Cyclohexane Practice <b>Test 1 Practice Tests:</b> V1, V2, V3, V4	
<b>TEST 2 LECTURES</b>		
10	Radical Halogenation; Mechanism; Radicals; Bond Energies; Reaction Energies. Last 12 minutes of Video.	4.1-4.7
11	Rate Laws, Transition States, Stability-Reactivity Principles	4.7-4.13
12	Radical Brominations. Major product, mechanism, structure isomers. Stability patterns for carbon radicals, cations, and anions.	4.13-4.16
13	Chiral vs achiral, Enantiomers, Recognizing/Drawing Mirror Images.	5.1-5.3
14	Chiral Carbons; Attachment Priorities; R/S Designation; Drawing Chiral Molecules	5.3-5.8
15	Racemic Mixtures, Optical Activity, Meso, Molecules with More than One Chiral Center	5.11-5.16
16	Drawing Stereoisomers, Meso Compounds. Alkyl Halides Intro, Classification, and Naming	6.1-6.7
17	The Sn2 Substitution Reaction.	6.8-6.12
18	The Sn1 Substitution Reaction.	6.13-6.16
19	SN1 Reactions in More Depth. Elimination Reactions	Catchup
20	E1 and E2 Reactions in More Depth; Recognizing Which Reaction Will Occur. Catchup, Practice.	7.9-7.15
21	Catchup/Practice. First ??? minutes of video 21. <b>Additional Practice Sets/Videos:</b> Br2/hv Products/Mechanisms Practice; Introductory Mechanism Practice; Extra Stereochemistry Practice; Extra Mechanisms + Product Prediction Practice <b>Test 2 Practice Tests:</b> V1, V2, V3, V4	
<b>TEST 3 LECTURES</b>		
21	Intro to alkenes, Elements of Unsaturation (EU), Last ??? minutes of video 21	7.1-7.6
22	Hydrogenation + Isomers; Alkene Nomenclature. E/Z; Heats of Hydrogenation	7.7-7.10
23	Alkene Synthesis. From RX. Bulky Bases. From Alcohols via Acid-Catalyzed E1. Mechanism Recognition.	7.10-8.2
24	Addition reactions to Alkenes. Addition of HBr; Acid-Catalyzed HOH Addn.	8.1-8.5
25	Acid-Catalyzed HOH Addn; Indirect HOH Addn (Hydroboration-Oxidation). Synthesis Design	8.5-8.7,8-10
26	anti-Mark HBr and HOH addition; Synthesis Design, H2 addn; Br2 addn	8.8-8.9
27	Br2 and BrOH additions and mechanisms; epoxidation	8.12-8.16
28	Epoxidation, Dihydroxylation, Ozonolysis. Stereospecific Alkene Reactions. Synthetic Design.	Catchup
29	Catchup/Practice. First ??? minutes of video 29. <b>Additional Practice Sets/Videos:</b> Test 3 Extra Practice 1; Test 3 Extra Mechanisms Practice; Test 3 Alkene Reactions Practice; Test 3 Extra Synthesis Practice (6 pages) <b>Test 3 Practice Tests:</b> V1, V2, V3, V4	
<b>TEST 4 LECTURES</b>		
29	Conjugation, Molecular Orbitals, Dienes, Allylic Cations, Additions to Dienes. Last ??? minutes of video.	15.1-6
30	More allylic cations/radicals/conjugation and Applications;	15.7-11
31	Diels-Alder Reaction; Aromaticity	15.11, 16.1-2
32	Aromaticity; Huckel's Rule and Complex Aromatics	16.1-7
33	Complex Aromaticity, Application, Nomenclature (Skip "endo rule" section in 15.11A, p. 684; Skip 15.12,13)	16.8-11, 13
34	Electrophilic Aromatic Substitution: Intro, Mech, Kinetic Effects	17.1,6-8
35	Reactions in Detail: Halogenation, Nitration, Sulfonation, Alkylation, Acylation	17.2-5,10,11
36	Catchup; Addition to Disubstituted Benzenes; Synthetic Applications	17.9, practice
37	Side Chain Reactions; Retrosynthesis; Synthetic Applications; Practice	17.14
38	Review for Test 4	---
39	More allylic cations/radicals/conjugation and Applications; <b>Additional Practice Sets/Videos:</b> HBr Addn to Dienes + NBS Allylic Bromination; Conjugation-Allylic-Diels-Alder Practice; Aromatic Substitution Mechanisms (Products Provided); Aromatic Substitution Product Prediction/Mechanisms/Synthesis Design <b>Test 4 Practice Tests:</b> V1, V2, V3, V4	15.7-11
Final Exam, Cumulative.		Final Exam