

ORGANIC CHEMISTRY I PROBLEMS, USING Klein 4

- Book: Organic Chemistry (4th Edition) by David Klein. Published by Wiley.
- [Google for solutions manual:](#)
- Other Textbooks: <https://web.mnstate.edu/jasperse/Chem350/Other-Textbooks.html>

<u>Chapter Topic</u>	<u>Klein Chap</u>	<u>Klein 4 Problems Back of the Chapter Screened by Jasperse</u>	<u>Klein 4 Problems In the Chapter Screened but not perfectly! ☺☺</u>
Test 1 (Wade 1-3)			
Review of Gen Chem	1	32 ("constitutional" = "structural"), 33, 34a, 35, 36, 39a-e, 41, 42(skip b), 43, 44, 45, 46, 47, 48, 49, 50, 52, 56, 62(only rank the 3 left-most structures), 63, 64, 65, 66, 71, 72, 73,	Isomers 1, 2, Lewis structure 3-6, Formal charge: 7-9, Polarity: 10-12 Structural formulas: 13,14 Hybridization: 21, 22 Geometry: 24-27 Intermolecular Forces: 31-31
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Chemical Reactivity and Mechanisms	6	37-40	Arrow-pushing: 11,12 Drawing arrows: 15,16
Alkanes Cycloalkanes	4	36a-d,g, 37, 38, 40a,b, 42, 43, 45, 47a, 48a, 51, 52a-c, 53, 56, 58, 62, 64-68	Nomenclature: 1-5, 8a,c,d, e, f, h, i, j, 9, Structure isomers: 14,15 Newman projection: 16, 17, 19,20 Cyclohexane chairs: 21-26, 28, 29, 30-32
Test 2 (Wade 4-6)			
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Alkyl Halides: Substitution + Elimination	7		E2: 12, 13, 15, 16, 17,19 Recognition: 28b, c, Alcohol dehydration: 33b, 34b,d
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		OsO ₄ /H ₂ O ₂ : O ₃ /Me ₂ S: 67, 81, 93 Product prediction: 49, 50, 64, 72 Synthesis design: 59, 61, 70, 75, 42-44, 57, 76, 45, 46, 53, 77, 84	CH ₃ CO ₂ H/H ₂ O: 28-30, OsO ₄ /H ₂ O ₂ : 31 O ₃ /Me ₂ S: 32-34, Product prediction: 35-38, Synthesis design: 39-41,
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Radical Reactions	10	NBS/peroxides Allylic bromination: 34e, 36, 39, 42, 44 Resonance: 24	NBS/peroxides Allylic bromination: 16-18

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

Organic Chemistry 1, Jasperse, Book Sections Are for Klein 4th Edition		
MSUM Videos	Topic	Book Section
TEST 1 LECTURES		
1	Intro. Why Carbon is Special, Normal bonding, Lewis Structures in Organic	1.1-3
2	1. Normal Bonding. 2. Formal Charge and Abnormal Bonding. 3. Electronegativity	1.3-9
3	1. Structural formulas: Full, Condensed, and Skeletal 2. Resonance Structures	2.7-2.13
4	1. Mechanism/Arrow-pushing. 2. Acid-Base Chemistry. 3. Anion Stability Patterns.	3.1,2,4,6
5	VSEPR 3D Shape. Drawing 3D; Hybridization; Pi bonds; Isomers,	1.10-14, 2.1-6
6	Polarity IMF, Boiling Points, Solubility. Catchup. Functional Groups	2.3
7	Functional Groups. Alkane Nomenclature	4.1-5
8	Alkane Nomenclature. Newman Projections; Torsional and Steric Strain; Cycloalkanes	4.6-9
9	Cyclohexane Chairs, Cis-and-Trans, Structural Isomers	4.9-14
10	Catchup/Practice. First 38 minutes of video 10. Additional Practice Sets/Videos: Mechanism Practice; Acid-Base Practice; 3D-Drawing Practice; Newman Projection Practice; Cyclohexane Practice Test 1 Practice Tests: V1, V2, V3, V4	
TEST 2 LECTURES		
10	Radical Halogenation; Mechanism; Radicals; Bond Energies; Reaction Energies. Last 12 minutes of Video.	10.1-4
11	Rate Laws, Transition States, Stability-Reactivity Principles	6.1-6
12	Radical Brominations. Major product, mechanism, structure isomers. Stability patterns for carbon radicals, cations, and anions.	6.8-12
13	Chiral vs achiral, Enantiomers, Recognizing/Drawing Mirror Images.	5.1-2
14	Chiral Carbons; Attachment Priorities; R/S Designation; Drawing Chiral Molecules	5.3-6
15	Racemic Mixtures, Optical Activity, Meso, Molecules with More than One Chiral Center	5.3-6
16	Drawing Stereoisomers, Meso Compounds. Alkyl Halides Intro, Classification, and Naming	7.1-3
17	The Sn2 Substitution Reaction.	7.3-7.8
18	The Sn1 Substitution Reaction.	7.3-7.8
19	SN1 Reactions in More Depth. Elimination Reactions	7.3-7.8
20	E1 and E2 Reactions in More Depth; Recognizing Which Reaction Will Occur. Catchup, Practice.	7.5-7.8
21	Catchup/Practice. First ??? minutes of video 21. Additional Practice Sets/Videos: Br2/hv Products/Mechanisms Practice; Introductory Mechanism Practice; Extra Stereochemistry Practice; Extra Mechanisms + Product Prediction Practice Test 2 Practice Tests: V1, V2, V3, V4	7.8-7.12
TEST 3 LECTURES		
21	Intro to alkenes, Elements of Unsaturation (EU), Last ??? minutes of video 21	14.16, 8.1-3
22	Hydrogenation + Isomers; Alkene Nomenclature. E/Z; Heats of Hydrogenation	8.2-4
23	Alkene Synthesis. From RX. Bulky Bases. From Alcohols via Acid-Catalyzed E1. Mechanism Recognition.	7.5-7.9
24	Addition reactions to Alkenes. Addition of HBr; Acid-Catalyzed HOH Addn.	8.4-5, 10.10
25	Acid-Catalyzed HOH Addn; Indirect HOH Addn (Hydroboration-Oxidation). Synthesis Design	8.5-8
26	anti-Mark HBr and HOH addition; Synthesis Design, H2 addn; Br2 addn	8.5-10
27	Br2 and BrOH additions and mechanisms; epoxidation	8.5-10
28	Epoxidation, Dihydroxylation, Ozonolysis. Stereospecific Alkene Reactions. Synthetic Design.	8.11-15
29	Catchup/Practice. First ??? minutes of video 29. Additional Practice Sets/Videos: Test 3 Extra Practice 1; Test 3 Extra Mechanisms Practice; Test 3 Alkene Reactions Practice; Test 3 Extra Synthesis Practice (6 pages) Test 3 Practice Tests: V1, V2, V3, V4	8.11-15
TEST 4 LECTURES		
29	Conjugation, Molecular Orbitals, Dienes, Allylic Cations, Additions to Dienes. Last ??? minutes of video.	16.1-3
30	More allylic cations/radicals/conjugation and Applications;	16.4-5, 10.7
31	Diels-Alder Reaction; Aromaticity	16.7, 17.1-4
32	Aromaticity; Huckel's Rule and Complex Aromatics	17.3-5
33	Complex Aromaticity, Application, Nomenclature	17.1-5
34	Electrophilic Aromatic Substitution: Intro, Mech, Kinetic Effects	18.1-6, 15
35	Reactions in Detail: Halogenation, Nitration, Sulfonation, Alkylation, Acylation	18.1-10, 15
36	Catchup; Addition to Disubstituted Benzenes; Synthetic Applications	18.1-12, 15
37	Side Chain Reactions; Retrosynthesis; Synthetic Applications; Practice	10.7, 17.6
38	Review for Test 4	catchup
39	More allylic cations/radicals/conjugation and Applications; Additional Practice Sets/Videos: HBr Addn to Dienes + NBS Allylic Bromination; Conjugation-Allylic-Diels-Alder Practice; Aromatic Substitution Mechanisms (Products Provided); Aromatic Substitution Product Prediction/Mechanisms/Synthesis Design Test 4 Practice Tests: V1, V2, V3, V4	catchup
Final Exam, Cumulative.		Final Exam