

- **CHEMISTRY 341 PROBLEMS**

- **SUMMER Carey Version 10**

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- These assume you are using Carey and Giuliano version 10. (I have lists that are appropriate if you instead have the 8<sup>th</sup> or 9<sup>th</sup> edition of Carey, or the 6<sup>th</sup> or 7<sup>th</sup> version of Wade. Contact me if that's your situation, or see:

- <http://www.ndsu.edu/pubweb/~jasperse/Chem341/Other%20Books-Problems%20and%20Readings/Other%20Books-Problems%20and%20Readings.htm>

| <u>Chapter</u> | <u>Recommended Book Problems</u>   |
|----------------|--|
|                | <u>Test 1</u>  |
| 1              | 1, 6, 7, 9- 13, 16, 17, 23-26, 31, 32, 35, 36, 41a, 42-51, 53, 60, 63-65, 68-71, 73, 74  |
| 2              | 3, 4, 6, 7, 8, 12, 13a,b, 22a,b, 23, 24a,b, 26, 31a,b,d, 33a,b, 34, 35, 36   |
| 3              | Newman Projections and Cyclohexane Chais: 1-4, 7, 8, 9, 12, 13, 18, 20-22, 25-28, 30, 32, 33, 39, 40   |
| 5              | Functional Groups: Ch. 5:3 (ignore pKa part), 29a,b,e,g 30, 31, 32   |
|                |  |
|                | <u>Test 2</u>  |
| 10             | Radicals and Radical Halogenation: 1, 4 (prop. only), 5, 8, 9, 21a   |
| 4              | Stereo: 1, 2, 3, 5, 8, 9, 12, 13, 18-21, 27-30, 38a,c-f,h-k  |
| 6              | Substitution: 1-3, 5, 7, 8, 9, 11, 19, 20a-g, 21, 22, 26, 27a-f, 30, 32a,b,d-h, 33, 38, 41-43<br>Ch5:20a,h   |
| 7              | Elimination: 21-25, 41, 38a,b,e, 45c,f,g, 48,  |
|                |  |
|                | <u>Test 3</u>  |
| 7              | 1-5, 7, 8, 10-17, 19, 21-25, 31a-h, 33, 38a-d (rank), 39a,b, 41, 42, 45  |
| 8              | 1, 4, 5, 6, 8, 9, 14, 17, 20, 23, 28a-f,i, 29a-f,i, 30a-f,i, 31, 33, 35, 38a-c, 40, 41, 44, 46, 48, 50a-f,i,k, 58-61, 63, 64, 69-73<br>Ch. 10:11, 19, 21b<br>Ch 16:5 |
|                |  |
|                | <u>Test 4</u>  |
| 11             | 1, 2, 3, 4, 5, 8, 9, 11, 12, 15, 16, 18, 21, 22, 31, 47a-f, 34a-c,g, 35a-c,g, 36, 37, 38, 39, 50, 46, 48, 44, 48, 49   |
| 12             | 1, 2, 3a,c, 9, 11, 13, 15, 18, 21, 24, 25, 26, 34a,f,i, 35, 39a, 41, 42, 45, 50- 54, 56d,e, 57a-d, h, i, 61a, b, e, f,   |
| 13             | 2, 3, 4, 6, 10, 12, 15, 17, 18, 19, 21, 22, 23 (hard), 24, 33a-d,g,i,l,m,, 35, 37, 39, 42, 45, 47, 48a-k, 49a-l,n, 50, 52, 54b,d, 55                                 |

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

| Chemistry 341, Jasperse, Summer (34 class lectures). <span style="background-color: yellow;">Carey Version 10</span>   |  | Reading Assignment     |
|--|--|------------------------|
| <b>TEST 1 LECTURES</b>   |  | Carey 10               |
| 1.   | Class Intro; Carbon, Normal Bonding, Lewis Structures  | 1.1-4                  |
| 2.   | Normal Bonding, Lewis Structures, Formal Charge; Resonance; Structural Formulas  | 1.5-10                 |
| 3.   | Structural + Skeletal Formulas; Resonance Structures; Allylic Systems; VSEPR + shape                                       | 1.5-10                 |
| 4.   | Shape, Drawing 3D, Mechanisms + Arrow Pushing, Acid-Base   | 1.9-16                 |
| 5.   | Acid-Base  | 1.11-16                |
| 6.   | Hybridization, Isomers, Intermolecular Forces, Boiling Points, Solubility  | 2.1-10, 2.20           |
| 7.   | Functional Groups.   | 2.19; 5.1, 5.6         |
| 8.   | Alkanes + Nomenclature.  | 2.11-18, 21            |
| 9.   | Conformations, Newman Projections, Higher Alkanes, Rings, Cyclohexane Chairs   | 3.1-6                  |
| 10.  | Substituted Cyclohexane Chairs; Alkane Structure Isomers   | 3.7-13                 |
| 11.  | 10 minutes of structural isomers. Then Test 2 material.  | Catchup                |
| Quick skim 2.1-10, Quick skim 3.13-15  |  |                        |
| <b>Extra Practice Sets+Videos:</b> Acid-Base Practice; 3D-Drawing Practice; Newman Practice; Cyclohexane Practice; Cyclohexane and Newman Projections Summary  |  |                        |
| <b>Test 1. Chapters 1-3.</b>   |  |                        |
| <b>TEST 2 LECTURES</b>   |  |                        |
| 11.  | Introduction to Reactivity Principles. Radical Halogenation of Alkanes.  | 10:1-4                 |
| 12.  | Rates, Activation Energies, Transition States, Multistep Reactions, Stability-Reactivity Principles                        | 10:1-4; 5:8            |
| 13.  | Bromination of Alkanes; Radical Stabilities; Mechanism; Practice Problems  | 10:1-4; 5:9            |
| 14.  | Practice Bromination Mech; Stability/reactivity: Chirality, Enantiomers, Chiral Centers                                    | 4:1-3                  |
| 15.  | R and S Classification, Stereochemical Prioritization Rules  | 4:4-6,8                |
| 16.  | Optical Activity; Racemic Mixtures; Symmetry Planes; Diastereomers; Meso Compounds; Molecules with $\geq 2$ Chiral Centers | 4.10-13,15             |
| 17.  | Alkyl Halides, Introduction/Nomenclature, Properties, Reactivity, and the SN2 Reaction The Sn2 Substitution Reaction.      | 5.2,4-6<br>6.1-5       |
| 18.  | SN2 Reactions  | 6.1-5                  |
| 19.  | SN1 Reaction and Mechanism   | 6.6-9                  |
| 20.  | Elimination Reactions  | 7.14-18                |
| 21.  | Elimination, Practice, how to Distinguish between SN2/SN2/E2/E1  | 7.14-18; 6.11,12       |
| Skip 4.1-14 at this time. Quick skim 7.7,9,16,17   |  |                        |
| <b>Extra Practice Sets+Videos:</b> Br2/hv Products/Mechanisms Practice; Introductory Mechanism Practice; Extra Stereochemistry Practice; Extra Test 2 Mechanisms Practice  |  |                        |
| <b>Test 2. Chapters 10, 4, 5, 6</b>  |  | <b>Test</b>            |
| <b>TEST 3 LECTURES</b>   |  |                        |
| 22.  | Alkenes. Elements of Unsaturation, Hydrogenation, Nomenclature, E/Z  | 7.1-7; 14.25           |
| 23.  | Synthesis of Alkenes. Use of Bulky Bases. Acid-Catalyzed Dehydration of Alcohols   | 7.8-19                 |
| 24.  | Recognizing Mechanisms. HBr and HOH addn to Alkenes. Markovnikov's Rule  | 8.1-7                  |
| 25.  | Antimarkovnikov HBr and HOH Addn. Stereoselective HOH.   | 8.6-9, 10.5, p.319-321 |
| 26.  | Addition of H <sub>2</sub> , Br <sub>2</sub> , BrOH, Stereospecificity, Synthetic Design                                   | 8.10-12,14             |
| 27.  | Epoxidation, Dihydroxylation, Ozonolysis   | 8.10-12,14             |
| Skim: 5.17, Skim: 6.14   |  |                        |
| <b>Extra Practice Sets+Videos:</b> Extra Practice; Mechanisms; Alkene Reactions; Synthesis   |  |                        |
| <b>Test 3. Chapters 5, 6</b>   |  | <b>Test</b>            |
| <b>TEST 4 LECTURES</b>   |  |                        |
| 28.  | Conjugation, It's Impact, and Allylic Cations  | 11.1-4, 11.9-11        |
| 29.  | Allylic Cations, Radicals, Anions, SN2. 1,4/1,2 Addn. Kinetic vs Thermo. Diels-Alder                                       | 11.2-10.10             |
| 30.  | Diels-Alder. Aromatics: Structure, Huckel's Rule, Impact   | 11.12-15, 11.1-7       |
| 31.  | Aromatic Nomenclature. Electrophilic Aromatic Substitution Reactions.  | 12.1-9,17-23           |
| 32.  | Electrophilic Aromatic Substitution Reactions. p4-11   | 13.1-8                 |
| 33.  | Advanced Aromatic Substitution Reactions and Synthetic Planning  | 13.9-16                |
| 34.  | Aromatic Synthesis Design Problems   | 13.1-16                |
| Skip: 11.10,16,17, 12.17-22  |  |                        |
| <b>Extra Practice Sets+Videos:</b> HBr Addn to Dienes; NBS Allylic Bromination; Conjugation-Allylic-Diels-Alder Practice; Aromatic Substitution Mechanisms; Aromatic Substitution Product Prediction/Mechanisms/Synthesis Design |  |                        |
| <b>Test 4. Chapters 10, 11, 12</b>   |  | <b>Test</b>            |