

CHEMISTRY 350 PROBLEMS, USING MCMURRY 7

<u>Chapter Topic</u>	<u>McM Chap</u>	<u>McMurry 7 Problems In the Chapter</u>	<u>Wade Chap</u>	<u>Carey 8 Problems</u>
Test 1				
Intro and Review	1	2, 5, 9-11, 13, 14a,b, 15-17, 18, 22, 24, 28, 31, 33, 34, 35, 49, 50, 52, 54	1	[Si only], 2a-f, 3a-g, 4, 5a-c, 6(all!), 7a,b,d,e,g, 8a,c,f,g,h, 9, 10d-h, 11, 15, 17a, 18a-c, 19a-f [determine which is the "nucleophile" (electron pair donor) and which is the "electrophile" (electron pair receiver), and draw the arrows to show bond making and breaking. Do not do the "Bonsted-Lowry" discussion.] 21, 23, 25-29, 31, 32, 34-37, 40-43, (for 42 and 43, you should be able to process H ₂ SO ₄ by memory, the others by structure without needing to look at a list of acidity values), 44 (use nucleophile/electrophile designation, and definitely practice the arrow pushing), 46
Polarity and Acidity	2	2, 5, 8-11, 13, 17, 19, 32-34, 36, 37, 40, 41, 45, 47, 53-56	2	1b (draw), 2 (skip part about 104.5° angle as opposed to 109° angle), 3, 4, 5a-f, 7a,b, 8, 9, 10 (three do, three don't; beware of "e", which is deceptive), 11, 16, 17 (omit a), 18-20, 21 (skip d), 22, [Note: for functional group problems, skip the "cyclic" designation!], 27, 28, 29 (we will see this is crucial to the performance of all proteins!), 30, 31, 33-35, 38-40, 41 (skip c), 42, 44
Alkanes	3	1 (not responsible for sulfide in 1a), 2, 4, 6, 8-12, 15, 16a-c, 17, 21-24, 26-29, 34, 38, 40, 42a,b, 44	3	1a, 2a, 3, 4a-e, 5, 6a,b, 7a,b, 9a, 11-13, 15b-d, 16, 17a,b, 18-21, 25-29, 33, 34 (omit c and d), 35 (omit b), 37 (omit e,g,h), 38, 39, 40b, 42, 43a,b, 44, 46
Cycloalkanes	4	1, 2, 4-6, 9, 12-14, 18 (draw, don't need to calculate), 22, 23, 25, 27-33, 35, 42, 53, 56		
Test 2				
Chemical Reactions.	5	2, 8, 9, 17, 18, 19, 29, 30, 31, 33, 35, 37	4	1a-c, 2, 3, 4a, 9a, 11-13, 15, 16, 18, 19a-d, 24, 25, 28-32, 35-39, 41, 42a, 43, 44, 46 (skip d) (Be Sure to do 46, very important)
Stereo chemistry	9	2, 3, 7-10, 13, 15, 16, 20, 35, 37, 42-48, 50-53	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, 26a,c,d,j-p, 27, 30d, F-h 31a, f-i, 36
Alkyl Halides	10	1, 3, 4 (major), 5, 17a-d, 30	6	1, 2c,e,f, 3 (parts 1 and 3, don't classify B or name k), 6, 7 (the density of chloroform is 1.50), 8a, 10 S _N 2 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), 21 [(the catch here is to understand why inversion can occur if (S) goes to (S))] S _N 1 Reactions: 22, 23, 24, 25, 26 (skip the mechanisms, but note how rearrangement forms a more stable cation), 27, 29 (very interesting. Probably not test fodder.) Elimination reactions: 30, 31, 32, 33b-d, 34-39, 40, 42a,c-e, 43a-c,e,f, 44**, 45("solvolysis" is substitution by solvent, and is always S _N 1), 46, 48-54, 56, 59-61
Alkyl Halides: SN2, SN1, E2, E1 Reactions	11	1, 2, 4, 5, 6, (OTs is best leaving group of all), 8, 11, 13, 15, 16, 20, 25a,c,d, 26, 25-27, 28a-c, 30a-e, 31a-e, 36, 37, 38, 41		
Test 3				
Alkenes	6	1, 2, 4-6, 7, 9-11, 13, 14-15, 16, 23, 24, 26, 29-30, 38-42, 45	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,f,g,h, 6a,d,e, 7a,c,e(name is ambiguous), 8a,c,e, 10a-d (more stable only. Skip the part about how much difference in energy), 12a,c, 13, 16, 17, 18, 19, 24, 25, 27-29 (note: in 28a, 29c,d cation rearrangements occur. I won't ask for mechanisms with cation rearrangement on your test, but a simple elimination of H ₂ O such as 29b or c is extremely likely.) 31, 32a,b,d, 33, 34 (for part c: how many rings does it have?), 36a-c, 38 (try to predict the major product. For test purposes I usually wouldn't want the minors), 39a,b,d (the point is to predict the major product), 44, 45

Alkene Addition Reactions	7	1-3, 5 (NBS = Br ₂), 6-10, 13-17, 24(skip e), 25c-e, 26, 27(omit c), 28, 29, 30, 31, 32, 33, 41, 42, 43a-d	8	1-4, 6, 8-11, 13-21(look at answer to e, just for interest sake), 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,d,f, 35 (d,l means racemic mix of chiral products), 36, 37, 47 (good practice for "predict the product" reactions.), 48a, b, c,e,f, 49a,b,c,d,e,f,h, 50a-l, 55, 58-61, 68
Test 4				
Conjugated Systems	14	2, 3, 5-9, 22, 24, 26 (major), 32, 33 (ignore stereo of phenyl group), 34, 36 (predict major), 37, 39	15	1, 2, 4, 5, 6, 7(skip c), 9, 10-11(NBS=Br ₂ /hv), 12, 13, 14, 15 (skip d), 16 (ignore stereochem), 18, 24, 25a-d,g-i, 26, 27, 30, 31, 33a-f
Aromatics	15	1, 2a,c,d, 3, 8, 9, 12, 18b-d,f, 19c-e, 37a	16	3(skip cyclooctatetraene), 5, 7b-d, 8, 9a, 10, 11, 12, 15, 16 (purine picture on top of page), 18, 22a, c,e,g, 24, 27a-f, 28a-c,e,f, 29, 32, 34 (hint: N lone pairs are strongly basic when sp ³ or sp ² but weakly basic when p), 35, 36, 37 ("xylene" means dimethyl benzene), 43
Aromatic Reactions	16	1, 6, 9, 10, 13, 15, 23, 24b, 29, 30a,c-f, 31a,b, 32, 33a,c,d, 34b-d, 35 (just rank), 37, 46, 48-50, 51a,d, 52b,d, 53a, 54a	17	2, 4(p-xylene is 1,4-dimethylbenzene), 6, 7, 8, 9, 12a, 14, 15, 16b(i-iv), 17a,c, 20a-c, 21, 22(skip c,d), 33, 34 (1), 36, 37, 44a,b,d,f,h,j,l, 45, 46a,b,e,f,g, 47b-f,h,i,j,l, 48, 49, 51, 57, 60, 61

Chemistry 341, Jasperse, Summer 2011 (38 class days)		Reading
Topic		Assignment
NO CLASS		
1.	Intro. Octet Rule, Lewis Structure, Hybridization, Bonding	1.1-11
2.	Formal Charge, Resonance, Hybridization + Shape; Drawing 3-D Shapes	1.12-2.6
3.	Acid-Base, Bond Rotation, Isomerism, Polarity, Intermolecular Forces, Solubility	2.7-2.13
4.	Classification of Organic Compounds. The Functional Groups.	3.1
5.	Formulas, Nomenclature, Conformations of Alkanes	3.2-7
6.	Conformations and Stability of Acyclic Alkanes and Cycloalkanes	4.1-4
7.	Conformations and Stability of Cyclohexanes, Catchup	4.5-9
8.	Alkane Chlorination. Factors to Think About in a Chemical Reaction.	5.1-8, 10.3-4
9.	Transition States, Multistep Reactions, Halogenation of Higher Alkanes.	5.9-11, 10.3-4
10.	Reactive Intermediates (Radicals, Cations, Anions)	5.9-11, 10.3-4
11.	Chirality, R/S Classification of Chiral Carbons.	9.1-5
12.	Test 1. Chapters 1-3.	
13.	Miscellaneous Stereochemistry	9.1-5
14.	Diastereomers; More than One Chiral Carbon	9.6-14
NO CLASS		
15.	Nomenclature, Structure, Properties, Reactivity of Alkyl Halides.	10.1-4
16.	The Sn2 Substitution Reaction.	11.1-3
17.	The Sn1 Substitution Reaction.	11.4-6
18.	The E1 and E2 Elimination Reactions. Substitution vs. Elimination?	11.7-12
19.	Catchup, Practice	Catchup
20.	Test 2. Chapters 4, 7, 8, 5	Test
21.	Alkenes: Structure, Nomenclature, Isomers.	6.1-5
22.	Alkene Stability; Synthesis.	6.6, 7.1
23.	Synthesis of Alkenes; Classifying/Recognizing Reaction Mechanisms; Alkenes	7.1, 17.6
24.	Addition of H-Cl, H-Br, and H-OH to Alkenes.	6.7-11, 7.2
25.	Oxymercuration/Dermercuration; Hydroboration/Oxidation; Hydrogenation	7.4, 7.5, 7.7
26.	Addition of Halogens, Formation of Halohydrins; Epoxidation	7.2-3
27.	Oxidation Reactions of Alkenes	7.8-9
28.	Catchup; Practice Problems	Catchup
29.	Test 3. Chapters 5, 6	Test
Skip 7.6, 10, 11		
30.	Intro; Conjugation, Molecular Orbitals, Dienes, Allylic Cations, Diene Additions	14.1-2
31.	More allylic cations/radicals/conjugation and Applications; Diels-Alder Reaction	14.3-4
32.	Diels-Alder Reaction, Aromaticity	14.4-5
33.	Aromaticity; Huckel's Rule, Complex Aromaticity, Application, Nomenclature	15.1-8
Skip: 14.6-10		
34.	Electrophilic Aromatic Substitution: Intro, Mechanisms	16.1-5
35.	Reactions in Detail: Halogenation, Nitration, Sulfonation, Alkylation, Acylation	16.1-5
36.	Catchup; Addition to Disubstituted Benzenes; Synthetic Applications	16.6,9-11
37.	Synthetic Applications; Practice	Practice
38.	Test 4. Chapters 10, 11, 12	Test