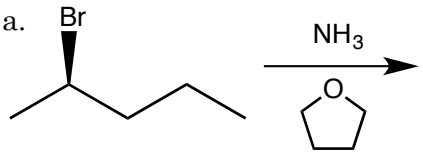
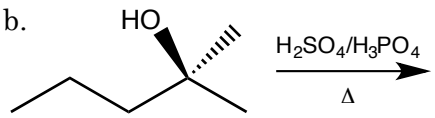
Name _____ Test 3 (4/29)
CHEM 0203 (Organic II) Spring 2015

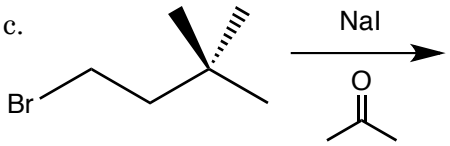
1. (12 pts.) Under the following conditions, would the reactions proceed predominantly through an E1, S_N1, E2, or S_N2 mechanism.

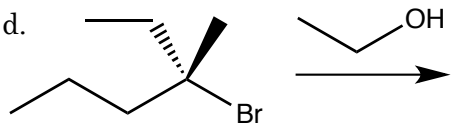
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

a. 

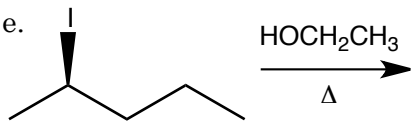
b. 

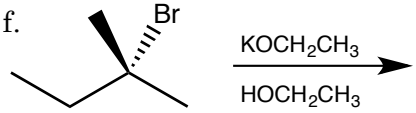
_____ _____

c. 

d. 

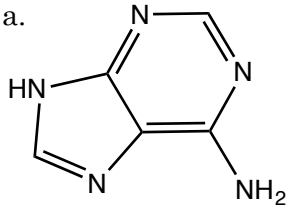
_____ _____

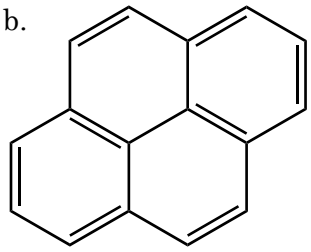
e. 

f. 

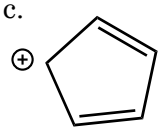
_____ _____

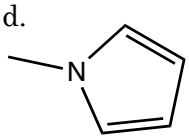
2. (12 pts.) Label the following molecules as aromatic, antiaromatic, or neither. If you think a portion of the molecule is aromatic or antiaromatic, circle that portion of the molecule and label it appropriately.

a. 

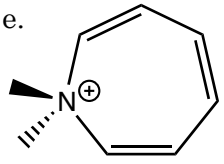
b. 

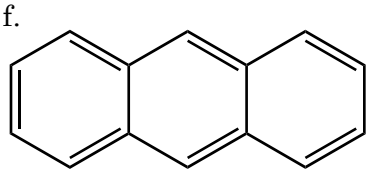
_____ _____

c. 

d. 

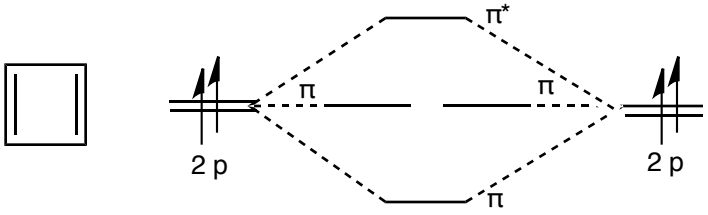
_____ _____

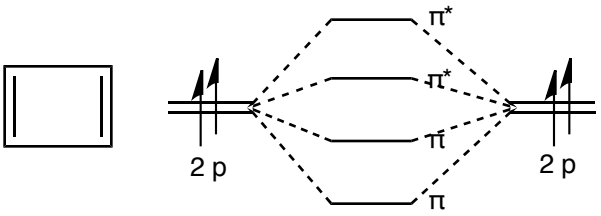
e. 

f. 

_____ _____

3. (14 pts.) Possible MO diagrams for the π system in 1,3-cyclobutadiene are drawn below.

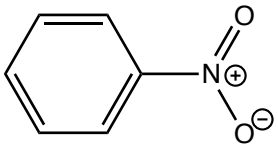


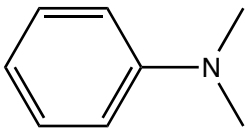


a. Complete the MO diagrams by adding e⁻'s to the appropriate places.

b. Is cyclobutadiene more likely to exist in the square conformation or in the rectangular conformation? Explain your response.

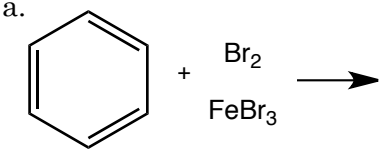
4. (12 pts.) Substituents on a benzene ring can affect the electron density in the π system of the benzene ring. Draw resonance structures that demonstrate how the substituents below affect the electron density in the π-system of the benzene ring.



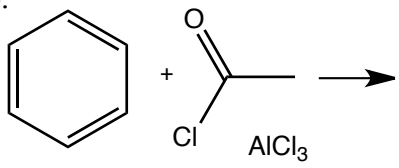


5. (12 pts.) Predict the product(s) for the following reactions.

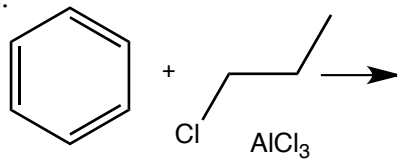
a.



b.

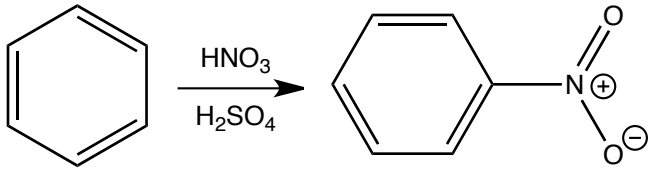


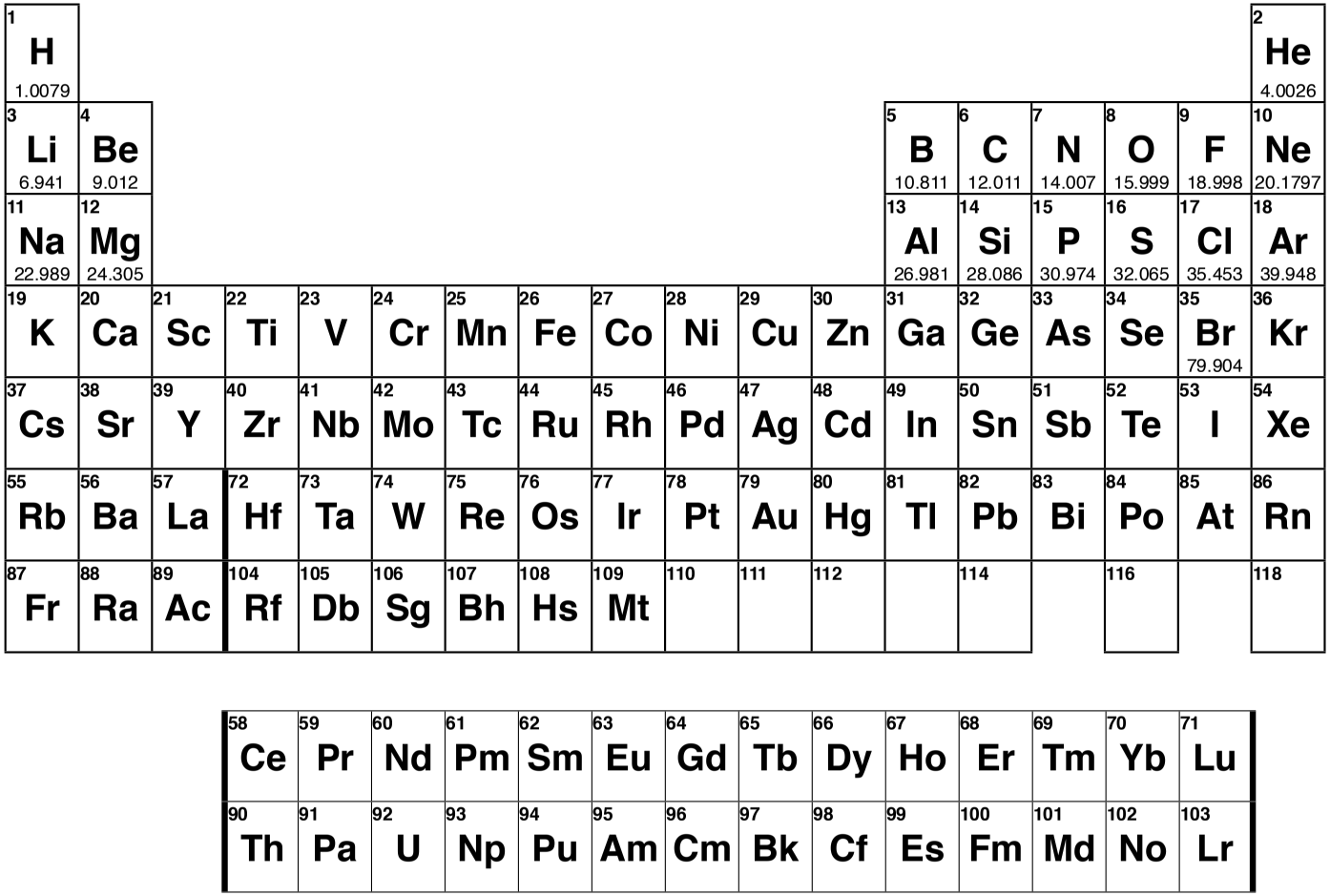
c.



6. (10 pts.) Draw a structure of the active electrophile and explain how HBr makes Br_2 more electrophilic.

7. (10 pts) Draw a mechanism that accounts for the formation of the product in the following reaction. Remember to include electron movement arrows.




1 H 1.0079
2 He 4.0026
3 Li 6.941
4 Be 9.012
5 B 10.811
6 C 12.011
7 N 14.007
8 O 15.999
9 F 18.998
10 Ne 20.1797
11 Na 22.989
12 Mg 24.305
13 Al 26.981
14 Si 28.086
15 P 30.974
16 S 32.065
17 Cl 35.453
18 Ar 39.948
19 K
20 Ca
21 Sc
22 Ti
23 V
24 Cr
25 Mn
26 Fe
27 Co
28 Ni
29 Cu
30 Zn
31 Ga
32 Ge
33 As
34 Se
35 Br 79.904
36 Kr
37 Cs
38 Sr
39 Y
40 Zr
41 Nb
42 Mo
43 Tc
44 Ru
45 Rh
46 Pd
47 Ag
48 Cd
49 In
50 Sn
51 Sb
52 Te
53 I
54 Xe
55 Rb
56 Ba
57 La
72 Hf
73 Ta
74 W
75 Re
76 Os
77 Ir
78 Pt
79 Au
80 Hg
81 Tl
82 Pb
83 Bi
84 Po
85 At
86 Rn
87 Fr
88 Ra
89 Ac
104 Rf
105 Db
106 Sg
107 Bh
108 Hs
109 Mt
110
111
112
114
116
118
58 Ce
59 Pr
60 Nd
61 Pm
62 Sm
63 Eu
64 Gd
65 Tb
66 Dy
67 Ho
68 Er
69 Tm
70 Yb
71 Lu
90 Th
91 Pa
92 U
93 Np
94 Pu
95 Am
96 Cm
97 Bk
98 Cf
99 Es
100 Fm
101 Md
102 No
103 Lr