Name _____ Test 2 (11/5)
CHEM 0201 (Organic) Fall 2021

1. (12 pts.) Draw a skeletal structure for (1*R*,2*R*)-1-methoxy-2-methylcyclopentane. Use wedge ( ) and dash ( ) bonds where appropriate.

1. _____

2. _____

3. _____

4. _____

2. (12 pts) Cyclopropane molecules are more reactive than other alkanes. Identify the hybridization of the carbon atoms in the cyclopropane ring and using valence bond theory and what we know about the shape of cyclopropane molecules explain why cyclopropane is less stable than other alkanes.

5. _____

6. _____

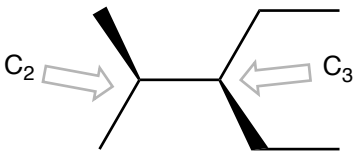
7. _____

8. _____

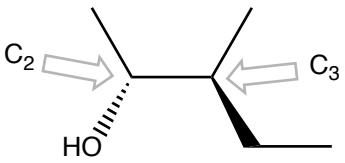
9. _____

3. (12 pts.) Draw Newman projections along the C_2 to C_3 bonds for the following skeletal structures.

a.

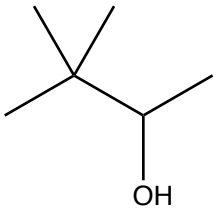


b.

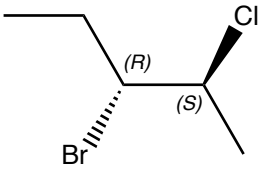


4. (24 pts.) Provide IUPAC names for the following structures and remember to include the stereochemical information in the names where appropriate. The configurations of the stereogenic centers are indicated on the structures.

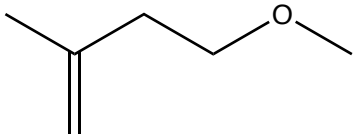
a.



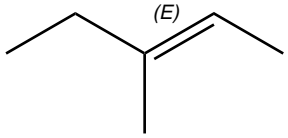
b.



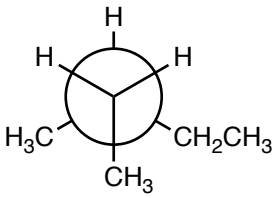
c.



d.

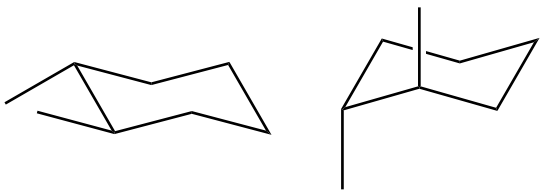


5. A rotamer for 3-methylpentane is drawn below. (**a**. 4 pts.) On the drawing below, circle groups experiencing gauche interactions. (**b**. 4 pts.) Draw the highest energy rotamer. (**c**. 4 pts.) Draw the lowest energy rotamer.

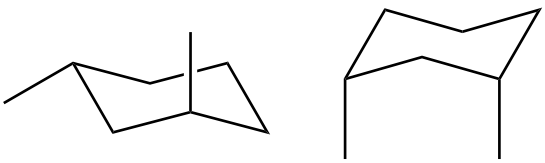


6. For each pair of structures below (a. 8 pts.) determine whether the structures represent a ring flip and (b. 8 pts.) circle the molecule that would be lower in energy.

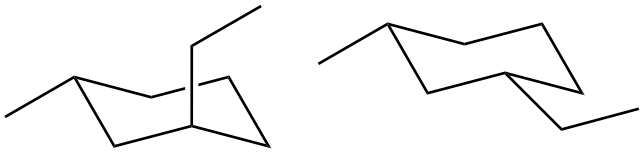
a.



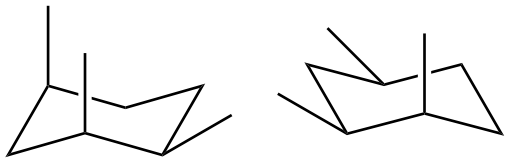
b.



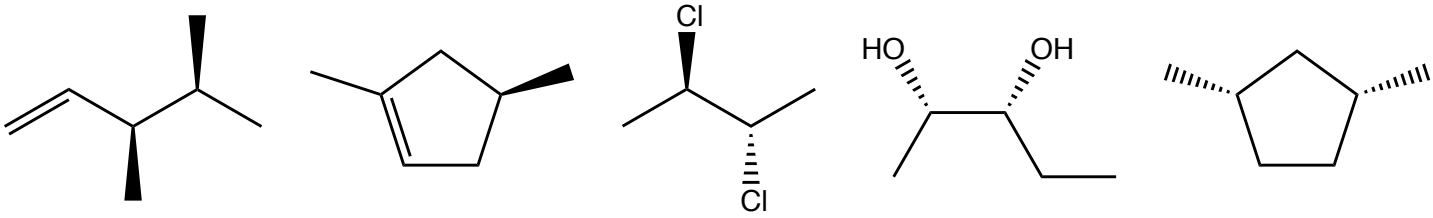
c.



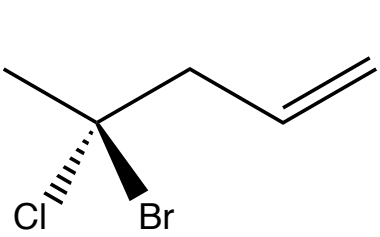
d.

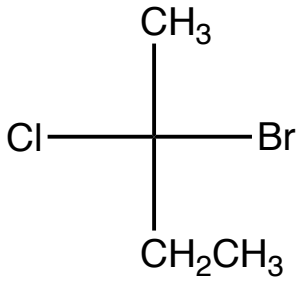


7. (a. 10 pts.) Place a * next to the chirality centers on the following structures, and (b. 10 pts.) circle the chiral molecules.



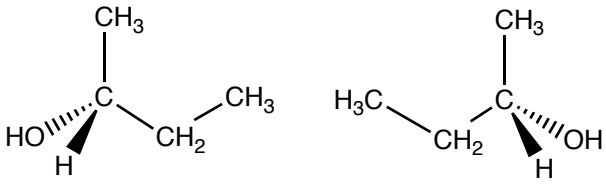
8. (12 pts.) Determine the configuration of the chirality centers in the following structures.



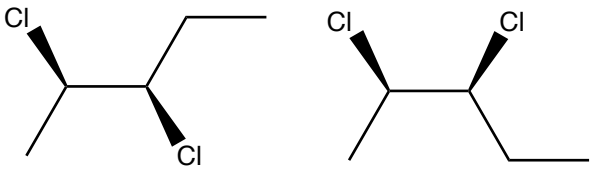


9. (12 pts.) Determine whether the pairs of structures below are enantiomers, diastereomers, or the same structure.

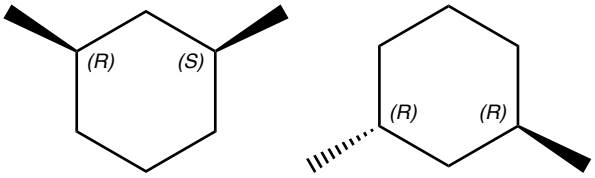
a.



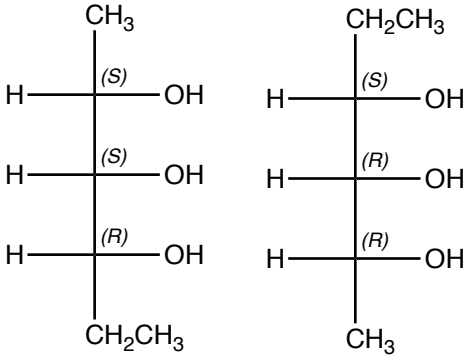
b.

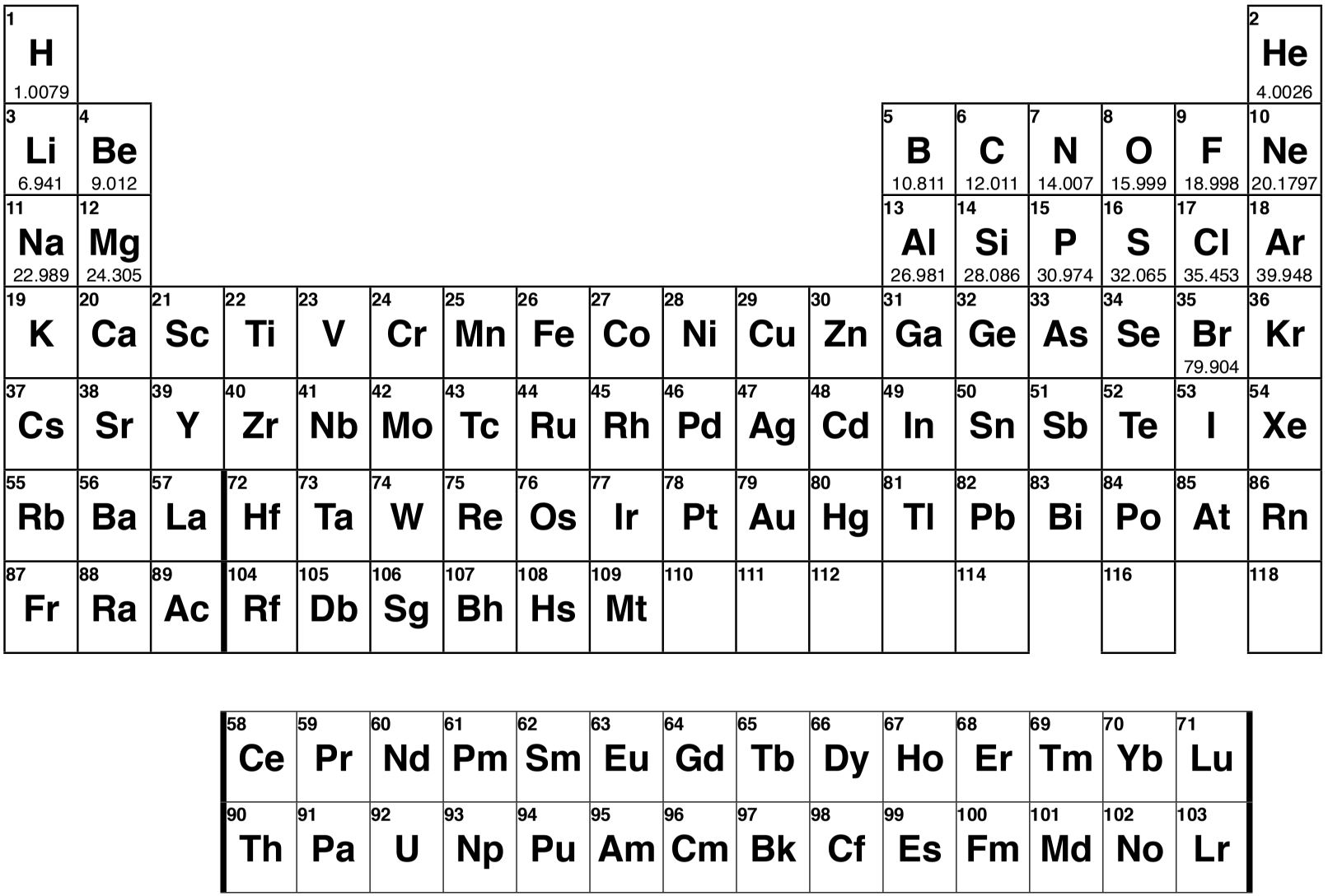


c.



d.




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