

## Chem 250

## In-class Quiz #1

This exam is composed of **17** questions.

*As discussed in the course syllabus, honesty and integrity are absolute essentials for this class. In fairness to others, dishonest behavior will be dealt with to the full extent of University regulations.*

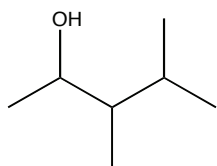
*I hereby state that all answers on this exam are my own and that I have neither gained unfairly from others nor have I assisted others in obtaining an unfair advantage on this exam.*

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Signature

## PERIODIC TABLE OF THE ELEMENTS

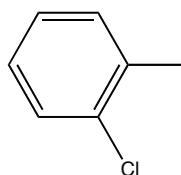
1A	2A	3B	4B	5B	6B	7B	8B	8B	8B	1B	2B	3A	4A	5A	6A	7A	8A
1 <b>H</b> 1.008																	2 <b>He</b> 4.003
3 <b>Li</b> 6.939	4 <b>Be</b> 9.012											5 <b>B</b> 10.81	6 <b>C</b> 12.01	7 <b>N</b> 14.01	8 <b>O</b> 16.00	9 <b>F</b> 19.00	10 <b>Ne</b> 20.18
11 <b>Na</b> 22.99	12 <b>Mg</b> 24.31											13 <b>Al</b> 26.98	14 <b>Si</b> 28.09	15 <b>P</b> 30.97	16 <b>S</b> 32.07	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.95
19 <b>K</b> 39.10	20 <b>Ca</b> 40.08	21 <b>Sc</b> 44.96	22 <b>Ti</b> 47.90	23 <b>V</b> 50.94	24 <b>Cr</b> 52.00	25 <b>Mn</b> 54.94	26 <b>Fe</b> 55.85	27 <b>Co</b> 58.93	28 <b>Ni</b> 58.71	29 <b>Cu</b> 63.55	30 <b>Zn</b> 65.39	31 <b>Ga</b> 69.72	32 <b>Ge</b> 72.61	33 <b>As</b> 74.92	34 <b>Se</b> 78.96	35 <b>Br</b> 79.90	36 <b>Kr</b> 83.80
37 <b>Rb</b> 85.47	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.91	40 <b>Zr</b> 91.22	41 <b>Nb</b> 92.91	42 <b>Mo</b> 95.94	43 <b>Tc</b> (99)	44 <b>Ru</b> 101.1	45 <b>Rh</b> 102.9	46 <b>Pd</b> 106.4	47 <b>Ag</b> 107.9	48 <b>Cd</b> 112.4	49 <b>In</b> 114.8	50 <b>Sn</b> 118.7	51 <b>Sb</b> 121.8	52 <b>Te</b> 127.6	53 <b>I</b> 126.9	54 <b>Xe</b> 131.3
55 <b>Cs</b> 132.9	56 <b>Ba</b> 137.3	57 <b>La</b> 138.9	72 <b>Hf</b> 178.5	73 <b>Ta</b> 181.0	74 <b>W</b> 183.8	75 <b>Re</b> 186.2	76 <b>Os</b> 190.2	77 <b>Ir</b> 192.2	78 <b>Pt</b> 195.1	79 <b>Au</b> 197.0	80 <b>Hg</b> 200.6	81 <b>Tl</b> 204.4	82 <b>Pb</b> 207.2	83 <b>Bi</b> 209.0	84 <b>Po</b> (209)	85 <b>At</b> (210)	86 <b>Rn</b> (222)
87 <b>Fr</b> (223)	88 <b>Ra</b> 226.0	89 <b>Ac</b> 227.0	104 <b>Unq</b> (261)	105 <b>Unp</b> (262)	106 <b>Unh</b> (263)	107 <b>Uns</b> (262)	108 <b>Uno</b> (265)	109 <b>Une</b> (266)									

1. (15 points) Draw the structure for 3,4-dimethyl-2-pentanol



(Chptr 14)

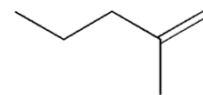
2. (15 points) Draw the structure for ortho-chlorotoluene



(Chptr 14)

**Oops – a typo in the exam means that everyone gets full credit for this.**

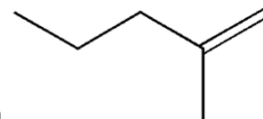
3. (5 points) What is the chemical formula for the molecule at right?



- 1) C<sub>6</sub>H<sub>8</sub>      2) C<sub>6</sub>H<sub>10</sub>      3) C<sub>6</sub>H<sub>12</sub>      4) C<sub>6</sub>H<sub>14</sub>      5) C<sub>6</sub>H<sub>16</sub>

**(3) CH<sub>3</sub>-CH<sub>2</sub>-CH<sub>2</sub>-C(CH<sub>3</sub>)-CH<sub>2</sub> (Chptr 11)**

4. (5 points) What is the product of the reaction of HBr with



- 1)      2)      3)

**(2) – This was a PRS question for 2/21/08 (Chptr 11)**

5. (5 points) What is the functional group in CH<sub>3</sub>CHO?

- 1) aldehyde    2) ether      3) alcohol      4) carboxylic acid    5) ketone

**(1) aldehyde (Chptr 11)**

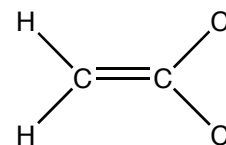
6. (5 points) What is the functional group in CH<sub>3</sub>COCH<sub>3</sub>?

- 1) aldehyde    2) ether      3) alcohol      4) carboxylic acid    5) ketone

**(5) ketone – (Chptr 11)**

7. (5 points) The molecule at right is

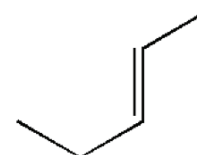
- 1) a cis isomer    2) a trans isomer    3) not an isomer



**(3) not an isomer (Chptr 12)**

8. (5 points) The molecule at right is

- 1) a cis isomer    2) a trans isomer    3) not an isomer

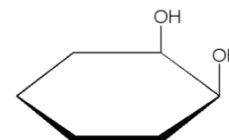


**(2) trans – with respect to the double bond (Chptr 12)**

9. (5 points) The molecule at right is

- 1) a cis isomer      2) a trans isomer      3) not an isomer

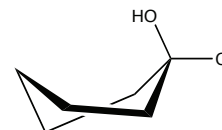
**(1) cis- with respect to the cyclic ring (Chptr 11)**



10. (5 points) In the molecule at right the chlorine is in what position?

- 1) axial              2) equatorial              3) cis              4) trans

**(2) equatorial (Chptr 11)**



11. (5 points) Which molecule below is more reactive, in general?

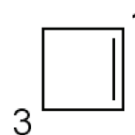
- 1)      2)      3) they have the same reactivity

**(1) addition reactions are possible (Chptr 12)**

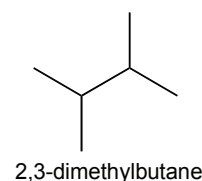
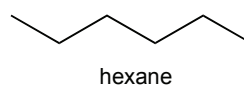
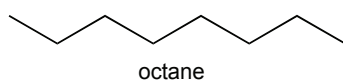
12. (5 points) In the molecule at right, the ideal bond angle around the 3-carbon is:

- 1) 120°              2) 109°              3) 90°              4) 180°

**(2) 109° It's sp<sup>3</sup> - OWL 12.1a (Chptr 12)**



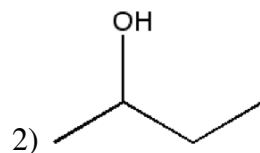
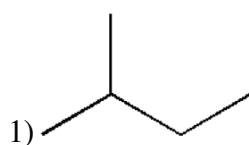
13. (5 points) Which molecule below has the highest boiling point?



- 1) octane              2) hexane              3) 2,3-dimethylbutane

**(1) it's longest & unbranched, so associates with itself best (Chptr 11)**

14. (5 points) Which molecule below has the lower boiling point?



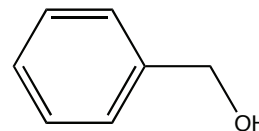
- 3) they have about the same boiling point

**(1) the hydroxyl group of 2-butanol allows for more self-association, so harder to put into gas phase (Chptr 14)**

15. (5 points) In the molecule at right, the alcohol is classified as:

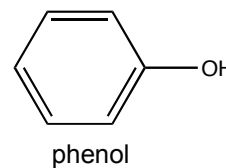
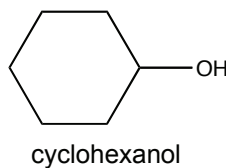
- 1) primary                      2) secondary                      3) tertiary

**(1) primary (Chptr 14)**



16. (5 points) Which is the stronger acid?

- 1) cyclohexanol  
2) phenol  
3) they are the same



**(2) alcohols are terrible acids, except for phenol. Because of resonance, phenol can delocalize the charge on the deprotonated species. Cyclohexanol cannot. (Chptr 14)**

17. (5 bonus points) What is the catalog number for this class?

- 1) 111                      2) 250                      3) 86                      4) 3.14159                      5) 68.6 g

**(2)**