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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.

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

- 1. (5 points) What is the chemical formula for the molecule $H_2C = CH_2$?
 - 1) C_2H
- 2) C_2H_2
- 3) C_2H_3
- 4) C_2H_4
- 5) C_2H_6

(4) – I hope this was trivially easy!

2. (5 points) What is the chemical formula for the molecule at right?

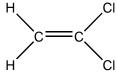


- 2) C_6H_{10}
- 3) C_6H_{12}
- 4) C_6H_{14}
- 5) C_6H_{16}

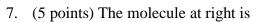
(2) CH₃-CH₂-CH-CH-CH₂

- 3. (5 points) What is the functional group in CH_3CH_2OH ?
 - 1) alcohol 2) ketone
- 3) aldehyde
- 4) carboxylic acid

- (1) alcohol
- 4. (5 points) What is the functional group in CH_3COCH_3 ?
 - 1) alcohol 2) ketone
- 3) aldehyde
- 4) carboxylic acid
- 5) ether
- (2) ketone the trick is to complete the octet around carbon 2. What do you have to do to achieve an octet?
- 5. (5 points) The molecule at right is
 - 1) a cis isomer
- 2) a trans isomer
- 3) not an isomer

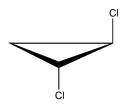


- (3) not an isomer
- 6. (5 points) The molecule at right is
 - 1) a cis isomer
- 2) a trans isomer
- 3) not an isomer
- (2) trans with respect to the double bond



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



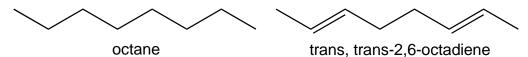




- 8. (5 points) In the molecule at right the hydroxyl is in what position?
 - 1) axial
- 2) equatorial
- 3) cis
- 4) trans

(2) equatorial

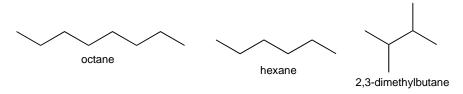
9. (5 points) Which molecule below is more reactive, in general?



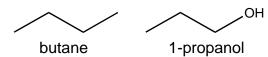
- 1) octane
- 2) trans, trans-2,6-octadiene 3) they have the same reactivity
- (2) addition reactions are possible only for the diene
- 10. (5 points) In the molecule at right, the ideal bond angle around the 4-carbon is:
 - 1) 120°
- 2) 109°
- 3) 90°
- 4) 180°
- (2) 109° It's sp³ OWL 12.1a



11. (5 points) Which molecule below has the lowest boiling point?



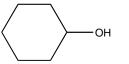
- 1) octane
- 2) hexane
- 3) 2,3-dimethylbutane
- (3) it's branched, so does not associate with itself well
- 12. (5 points) Which molecule below has the lowest boiling point?



- 1) butane
- 2) 1-propanol
- (1) the hydroxyl group of propanol allows for more self association, so harder to put into gas phase
- 13. (5 points) In the molecule at right, the alcohol is classified as:
 - 1) primary
- 2) secondary
- 3) tertiary

(1) primary

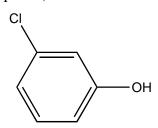
- 14. (5 points) Which is the stronger acid?
 - 1) cyclohexanol
 - 2) phenol
 - 3) they are the same



ОН cyclohexanol phenol

- (2) alcohols are terrible acids, except for phenol. Because of resonance, phenol can delocalize the charge on the deprotonated species. Cyclohexanol cannot.
- 15. (15 points) Draw the structure for 4,5-dimethyl-3-hexanol

16. (15 points) Draw the structure for 3-chlorophenol



- 17. What is the catalog number for this class?
 - 1) 111
- 2) 250
- 3) 86
- 4) 345
- 5) 68.6 g

(2)