Name

CHM 2001 - Organic Chemistry I

Quiz I – Thursday 23 September 2010

Professor Parikh

Please read through each problem carefully and enter your answer in the box provided. A periodic table is provided at the end of the exam with additional scrap paper.

- the exam is closed book (no book or notes allowed)
- you may not refer to your cellular phone or pager (please turn them off)
- You may use your model set (there is no borrowing or leading of model sets)

A note about drawing structures: <u>You should use line structures</u>; make your drawings as clear as possible to understand - stereochemistry should be indicated unambiguously using conventional drawing techniques (eg. bold wedges and dashes).

Problem 1	/ 20 pts
Problem 2	/ 6 pts
Problem 3	/ 6 pts
Problem 4	/ 8 pts

TOTAL	/ 40 points
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Problem 1: Give the letter of the term that best matches the given definitions below (20 points; 2 points each). Provide the answers in the box provided on the bottom page.

- a. Brønsted-Lowry Acid f.
- **b.** Brønsted-Lowry Base
- **c.** Lewis Acid
- d. Lewis Base

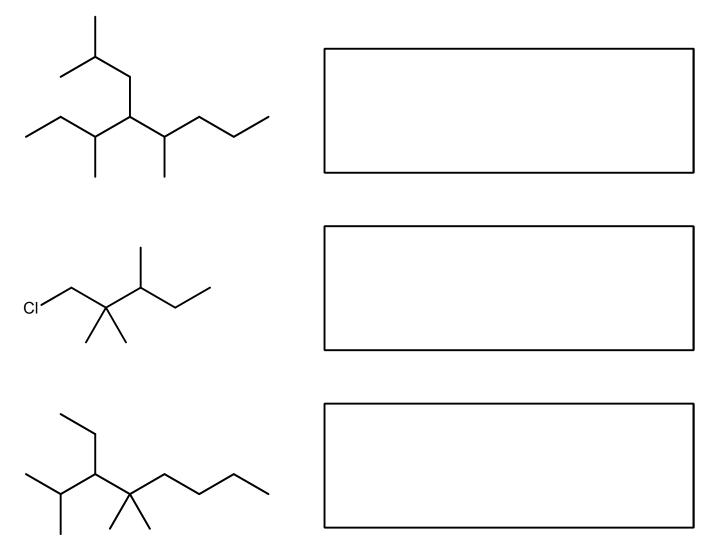
Covalent Bond g.

Ionic Bond

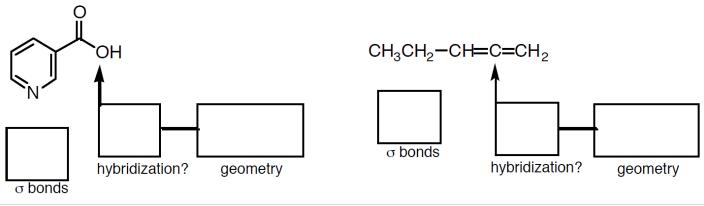
- Polar-Covalent Bond h. Hydrophobic i.
- e. Electronegativity
- j. Hydrophilic
- 1. Any species that can accept electrons.
- 2. A bond between two atoms differing in electronegativity by 0.5 2.
- 3. A term used to describe a "water loving" species.
- 4. A compound that can donate a proton.
- 5. The ability of an atom to attract the shared electrons in a covalent bond.
- 6. A term used to describe a "water fearing" species.
- 7. Any species that can donate electrons.
- 8. A bond between two atoms differing in electronegativity by < 0.5
- 9. A compound that can accept a proton.
- 10. A bond between two atoms differing in electronegativity by > 2.

1.	2.	3.	4.	5.
6.	7.	8.	9.	10.

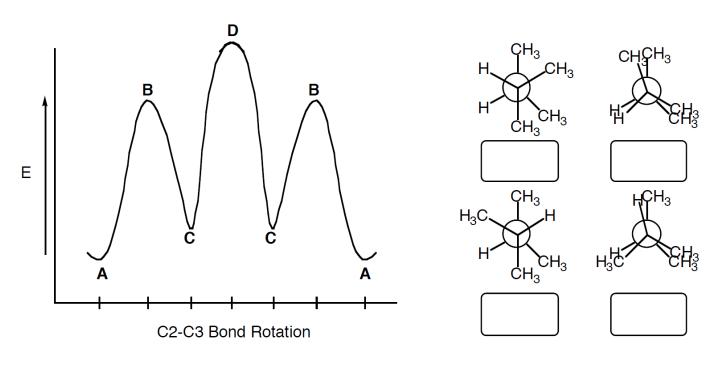




Problem 3: For the following compounds, determine the number of sigma bonds, and indicate the hybridization and geometry of the specified atoms. (6 points; 1 point each).



Problem 4: The energy diagram below shows the energy change in the conformations of 2,3dimethylbutane as the C2-C3 bond is rotated. Each extreme in energy is marked with a letter. In the box below each conformation place the letter that corresponds to that extreme. (8 points; 2 points each).



		1 Group IA																	18 Group VIIIA
	1	1 H 1008	2 Group IIA		22 Atomic number Ti Symbol 47.88 Atomic mass					MetalSemimetalNonmetal			13 Group IIIA	14 Group IVA	15 Group VA	16 Group VIA	17 Group VIIA	2 He 4.003	
	2	3 Li 6.941	4 Be 9.012	e									5 B 10.81	6 C 12.01	7 N 14.01	8 0 16.00	9 F 19.00	10 Ne 20.18	
	3	11 Na 22.99	12 Mg 24.31	3 Group IIIB	4 Group IVB	5 Group VB	6 Group VIB	7 Group VIIB	8 Group ◀	9 Group VIIIB	10 Group	11 Group IB	12 Group IIB	13 AI 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 CI 35.45	18 Ar 39.95
Period	4	19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.88	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.39	31 Ga 69.72	32 Ge 72.61	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
	5	37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 9122	41 Nb 92.91	42 Mo 95.94	43 Tc (98)	44 Ru 101.1	45 Rh 102.9	46 Pd 106.4	47 Ag 107.9	48 Cd 112.4	49 In 114.8	50 Sn 118.7	51 Sb 121.8	52 Te 127.6	53 I 126.9	54 Xe 131.3
	6	55 Cs 132.9	56 Ba 137.3	57 La 138.9	72 Hf 178.5	73 Ta 180.9	74 W 183.8	75 Re 186.2	76 0s 190.2	77 Ir 192.2	78 Pt 195.1	79 Au 197.0	80 Hg 200.6	81 TI 204.4	82 Pb 207.2	83 Bi 208.0	84 Po (209)	85 At (210)	86 Rn (222)
	7	87 Fr (223)	88 Ra (226)	89 Ac (227)	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (264)	108 Hs (269)	109 Mt (268)	110 Ds (271)	111 Rg (272)							
					6	58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm 146.9	62 Sm 150.4	63 Eu 152.0	64 Gd 157.3	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.3	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0
					- 7	90 Th 232.0	91 Pa 2310	92 U 238.0	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (262)
An atomic mass in parentheses indicates the mass of the most stable isotope of that element.																			