

Chem 10113, Quiz 5

November 7, 2018

Name: _____

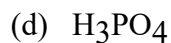
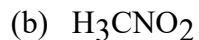
(Please Print)

	IA (1)																VIIIA (18)	
1	1 H 1.0080																2 He 4.0026	
2	3 Li 6.9410	IIA (2)	4 Be 9.0122										5 B 10.811	6 C 12.011	7 N 14.007	8 O 15.999	9 F 18.998	10 Ne 20.179
3	11 Na 22.990	12 Mg 24.305	IIIB (3)	IVB (4)	VB (5)	VIB (6)	VIIIB (7)	VIIIB (8)	VIIIB (9)	VIIIB (10)	IB (11)	IIB (12)	13 Al 26.982	14 Si 28.086	15 P 30.974	16 S 32.066	17 Cl 35.453	18 Ar 39.948
4	19 K 39.098	20 Ca 40.078	21 Sc 44.956	22 Ti 47.880	23 V 50.942	24 Cr 51.996	25 Mn 54.938	26 Fe 55.847	27 Co 58.933	28 Ni 58.690	29 Cu 63.546	30 Zn 65.380	31 Ga 69.723	32 Ge 72.610	33 As 74.922	34 Se 78.960	35 Br 79.904	36 Kr 83.800
5	37 Rb 85.468	38 Sr 87.620	39 Y 88.906	40 Zr 91.224	41 Nb 92.906	42 Mo 95.940	43 Tc 98.907	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.75	52 Te 127.60	53 I 126.90	54 Xe 131.29
6	55 Cs 132.91	56 Ba 137.33	57 La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.21	76 Os 190.20	77 Ir 192.22	78 Pt 195.09	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.20	83 Bi 208.98	84 Po 208.98	85 At 209.99	86 Rn 222.02
7	87 Fr 223.02	88 Ra 226.03	89 Ac 227.03	104 Unq 261.11	105 Unp 262.11	106 Unh 263.12	107 Uns 262.12											

1. (9 points) Apply **VSEPR** concepts to the following molecules. For each one, draw a clear 3-D structure and give a *description* of the shape (i.e., bent, trigonal planer, etc.). Also, *state* whether each molecule is *polar* or *non-polar*.



2. (9 points) For each of the following molecules or ions, write the *complete* Lewis electron dot formula. Include formal charges and/or resonance forms where appropriate.

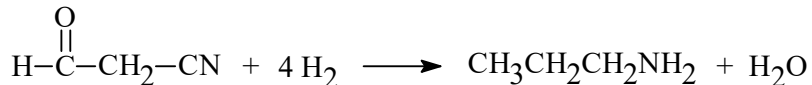


3. (a) (2 points) Based on your answers above, what is the N–O bond order in each species?



(b) (1 point) Of the three species above, the longest N–O bond is found in _____.

4. (4 points) **SHOW ALL WORK.** Using the table of bond energies, estimate the enthalpy change (ΔH°) for the following "hydrogenation" reaction.



Bond Energy (kJ/mole)

C–H 414

O–H 464

N–H 389

H–H 436

C–C 347

C=C 611

C–O 361

C=O 736

C≡O 1072

C–N 305

C=N 615

C≡N 891