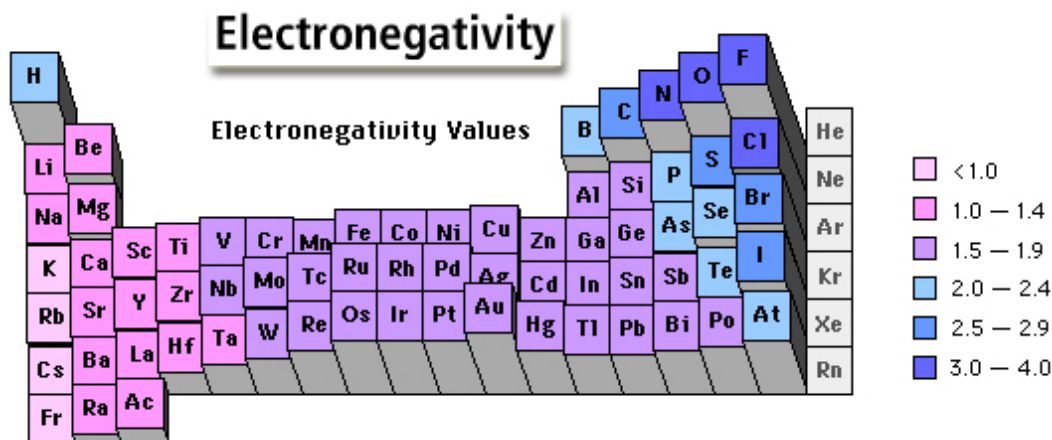


The Periodic Table

<i>IA</i>																<i>VIIIA</i>	
H 1 1.01																He 2 4.00	
<i>IIA</i>												<i>IIIA</i>	<i>IVA</i>	<i>VIA</i>	<i>VIA</i>	<i>VIIA</i>	<i>VIIIA</i>
Li 3 6.94	Be 4 9.01											B 5 10.81	C 6 12.01	N 7 14.01	O 8 16.00	F 9 19.00	Ne 10 20.18
Na 11 22.99	Mg 12 24.31	<i>IIIB</i>	<i>IVB</i>	<i>VB</i>	<i>VIB</i>	<i>VIB</i>	<i>VIB</i>	<i>VIB</i>	<i>VIB</i>	<i>IB</i>	<i>IIB</i>	Al 13 26.98	Si 14 28.09	P 15 30.97	S 16 32.07	Cl 17 35.45	Ar 18 39.95
K 19 39.10	Ca 20 40.08	Sc 21 44.96	Ti 22 47.88	V 23 50.94	Cr 24 52.00	Mn 25 54.94	Fe 26 55.85	Co 27 58.93	Ni 28 58.69	Cu 29 63.55	Zn 30 65.39	Ga 31 69.72	Ge 32 72.61	As 33 74.92	Se 34 78.96	Br 35 79.90	Kr 36 83.80
Rb 37 85.47	Sr 38 87.62	Y 39 88.91	Zr 40 91.22	Nb 41 92.91	Mo 42 95.94	Tc 43 (97.9)	Ru 44 101.07	Rh 45 102.91	Pd 46 106.42	Ag 47 107.87	Cd 48 112.41	In 49 114.82	Sn 50 118.71	Sb 51 121.76	Te 52 127.60	I 53 126.90	Xe 54 131.29
Cs 55 132.91	Ba 56 137.33	La 57 138.91	Hf 72 178.49	Ta 73 180.95	W 74 183.85	Re 75 186.21	Os 76 190.2	Ir 77 192.22	Pt 78 195.08	Au 79 197.97	Hg 80 200.59	Tl 81 204.38	Pb 82 207.2	Bi 83 208.98	Po 84 (209)	At 85 (210)	Rn 86 (222)
Fr 87 223.02	Ra 88 226.03	Ac 89 227.03	Rf 104 (261)	Db 105 (262)	Sg 106 (263)	Bh 107 (262)	Hs 108 (265)	Mt 109 (266)	Ds 110 (271)	Rg 111 (272)	Uub 112 (285)	Uut 113 (284)	Uuq 114 (289)	Uup 115 (288)			

Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 (145)	Sm 62 150.36	Eu 63 152.97	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.04	Lu 71 174.97
Th 90 232.04	Pa 91 231.04	U 92 238.03	Np 93 237.05	Pu 94 (240)	Am 95 243.06	Cm 96 (247)	Bk 97 (248)	Cf 98 (251)	Es 99 252.08	Fm 100 257.10	Md 101 (257)	No 102 259.10	Lr 103 262.11



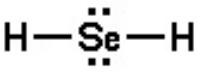

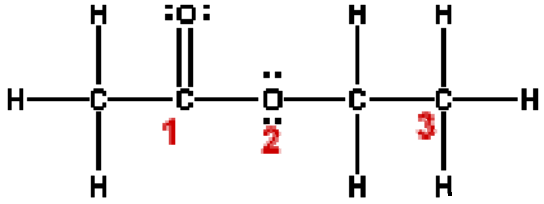
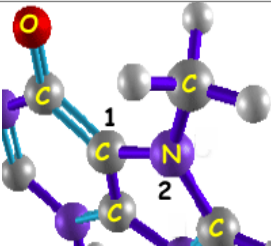
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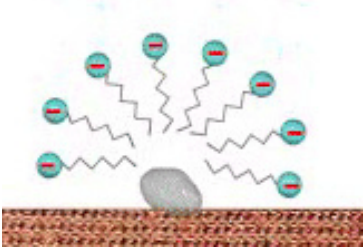
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Last _____

First _____

Question 1 6 Points		The following questions pertain to the Lewis Dot structure depicted on the left
a) With respect to the central nitrogen atom :		
i. The number of lone pairs : _____		
ii. The number of single bonds : _____		
iii. The number of double bonds : _____		
b) How many equivalent Lewis Structures does the nitrite ion have? _____		
Question 2 12 Points	Draw a Lewis structure for each of the following where the central atom obeys the octet rule .	
	N ₂	NCl ₃ (Cl = Chlorine)
	NOF	Cyanide ion
Question 3 12 Points (6 Points)	CH ₃ CH ₂ COOH	<u>Count double bonds as 2 bonds for this structure only.</u> a) The number of C-H bonds _____ b) The number of C-C bonds _____ c) The number of C-O bonds _____
(6 Points)	C ₂ H ₄	a) The number of C-H bonds _____ b) The number of C-C single bonds _____ c) The number of C=C double bonds _____
Question 4 6 Points	a) Name of the compound with the formula N₂O ? _____ b) Name of the compound with the formula SO₂ ? _____ c) Formula for dinitrogen tetraoxide ? _____	

<p>Question 5 4 Points</p>	<p>Draw all resonance structures for HCO_2^-:</p>	
<p>Question 6 6 Points</p>		<p>The following questions pertain to the Lewis Structure of SeH_2 depicted on the left:</p> <p>a) The electron-pair geometry around Se is: _____</p> <p>b) The molecular geometry around Se is: _____</p>
<p>Question 7 6 Points</p>	<p>a) What is the electron-pair geometry about N in NCl_2: _____</p> <p>b) What is the molecular geometry about N in NCl_2: _____</p>	
<p>Question 8 6 Points</p>		<p>What is the molecular geometry about:</p> <p>a) Atom 1: _____</p> <p>b) Atom 2: _____</p> <p>c) Atom 3: _____</p>
<p>Question 9 6 Points</p>		<p>The predicted bond angle about:</p> <p>a) Atom 1: _____</p> <p>b) Atom 2: _____</p> <p>c) Atom 3: _____</p>
<p>Question 10 4 Points</p>		<p>What is the predicted bond angle about the following atoms?</p> <p>a) Carbon 1 _____</p> <p>b) Nitrogen 2 _____</p>
<p>Question 11 6 Points</p>	<p>Label the following molecules as polar or nonpolar. (The central atom is given first in the formula)</p> <p>a) NOCl (Cl = Chlorine) _____</p> <p>b) N₂ _____</p> <p>c) SCl₂ (Cl = Chlorine) _____</p>	

<p>Question 12 3 Points</p>	<p>In our discussion on the consequences of molecular polarity, the cartoon shown below was used to discuss:</p>  <p>a) Membranes b) Micelle action c) Fabric softeners d) Like dissolves like e) Detergents</p>
<p>Question 13 4 Points</p>	<p>Write the equilibrium constant expression, K, for the following reactions:</p> <p>a) $F^- + H_2O(l) \rightleftharpoons HF(aq) + OH^-$ $K =$ _____</p> <p>b) $2NOCl(g) \rightleftharpoons 2NO(g) + Cl_2(g)$ $K =$ _____</p>
<p>Question 14 4 Points</p>	<p>For the following equilibrium system, $K = 4.50 \times 10^{10}$ at 298K.</p> $HNO_2(aq) + OH^- \rightleftharpoons NO_2^- + H_2O(l)$ <p>Assuming that you start with equal concentrations of HNO_2 and OH^-, and that no NO_2^- is initially present, which of the following best describes the equilibrium system?</p> <p>a) The reverse reaction is favored at equilibrium. b) Very little HNO_2 will be present at equilibrium c) Appreciable quantities of all species are present at equilibrium. d) The forward reaction is favored at equilibrium.</p>
<p>Question 15 4 Points</p>	<p>Consider the following system at equilibrium at 723 K</p> $2NH_3(g) \rightleftharpoons N_2(g) + 3H_2(g)$ <p>When some $NH_3(g)$ is removed from the equilibrium system at 723K The reaction must:</p> <p>a) Run in the forward direction b) Run in the reverse direction c) Remain the same</p> <p>The concentration of H_2 will</p> <p>a) Increase b) Decrease c) Remain the same</p>
<p>Question 16 4 Points</p>	<p>Consider the following system at equilibrium at 298 K:</p> $2NO(g) \rightleftharpoons N_2(g) + O_2(g) + 43.2 \text{ kcal}$ <p>If the temperature on the equilibrium system is suddenly increased: The reaction must:</p> <p>a) Run in the forward direction b) Run in the reverse direction c) Remain the same</p> <p>This is because by increasing the temperature, K:</p> <p>a) Increases b) Decreases c) Remain the same</p>

<p>Question 17 3 Points</p>	<p>Consider the following system at equilibrium at 298K: $\text{HNO}_2(\text{aq}) + \text{OH}^- \rightleftharpoons \text{NO}_2^- + \text{H}_2\text{O}(\text{l})$ The addition of H_3O^+ will cause the concentration of HNO_2 to:</p> <p>a) Increase b) Decrease c) Remain the same</p>
<p>Question 18 4 Points</p>	<p>Consider the following exothermic reaction at equilibrium at 800K $2\text{H}_2(\text{g}) + \text{S}_2(\text{g}) \rightleftharpoons 2\text{H}_2\text{S}(\text{g})$ The production of $\text{H}_2\text{S}(\text{g})$ is favored by: Indicate True (T) or False (F) for each of the following:</p> <p>a) Increasing the temperature. _____ b) Decreasing the volume. _____ c) Removing S_2. _____ d) Decreasing the pressure. _____</p>

Do Not Write Below This

Exam II Score