

The Periodic Table

<i>IA</i> H 1 1.01																	<i>VIIIA</i> He 2 4.00
<i>IIA</i> Li 3 6.94	Be 4 9.01											<i>IIIA</i> B 5 10.81	<i>IVA</i> C 6 12.01	<i>V</i> N 7 14.01	<i>VIA</i> O 8 16.00	<i>VIIA</i> 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>	<i>IIIA</i> Al 13 26.98	<i>IVA</i> Si 14 28.09	<i>V</i> P 15 30.97	<i>VIA</i> S 16 32.07	<i>VIIA</i> 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)			

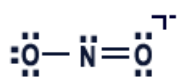
Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 (145)	Sm 62 150.36	Eu 63 152.97	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.04	Lu 71 174.97
Th 90 232.04	Pa 91 231.04	U 92 238.03	Np 93 237.05	Pu 94 (240)	Am 95 243.06	Cm 96 (247)	Bk 97 (248)	Cf 98 (251)	Es 99 252.08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

SID

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Last _____ First _____

Question 1 To answer the questions, interpret the following Lewis diagram for NO_2^- .
8 Points With respect to the **central nitrogen atom**:



- a) The number of **lone pair** _____
- b) The number of **single bond** _____
- c) The number of **double bond** _____
- d) The number of **resonance structures** _____

Question 2 Draw a Lewis structure for each of the following where the central atom obeys the **octet rule**.
16 Points ClO_4^-

	HCN
HFCO	CO

Question 3 Draw a Lewis structure (*on scrap paper provided*) for $\text{CH}_3\text{COOCH}_3$. Use your diagram to answer the following questions.
8 Points

- a) The number of C-H bonds = _____
- b) The number of C-O single bonds = _____
- c) The number of C-C single bonds = _____
- a) The number of C-O double bonds = _____

Question 4 CH_3COO^- has resonance structures - draw them.
8 Points

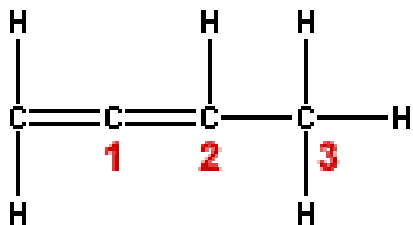
Question 5 What is the name of the compound with the formula:

- a) N_2O_4 _____
- b) PCl_5 _____

What is the formula for:

- a) **Sulfur trioxide** _____
- b) **Carbon tetrachloride** _____

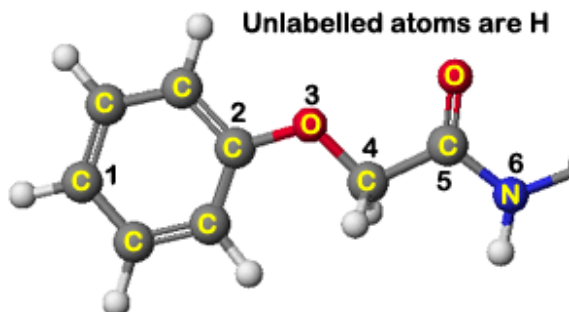
Question 6
6 Points



What is the bond angle about:

- a) 1: _____
 b) 2: _____
 c) 3: _____

Question 7
6 Points



What is the **bond angle** about the following atoms?

- O3 _____
 C4 _____
 C5 _____

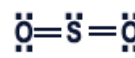
Question 8
16 Points



A



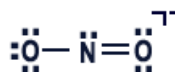
B



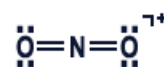
C



D



E



F

The following questions relate to the Lewis Structures depicted above

- The number of molecules that **disobey** the **Octet Rule**: _____
- D, E and F** - the one with the **smallest** bond angle: _____
- The **molecular geometry** of **D**: _____
- The **molecular geometry** of **E**: _____
- The **number** of **molecules** with a bond angle of $\sim 120^\circ$: _____
- D, E and F** - the one that is **non polar**: _____
- B** - **Polar** or **non polar**? _____
- The **Electron Pair Geometry** of **C**: _____

Question 9
5 Points

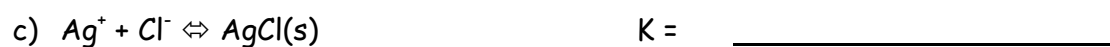


Assuming that you start with equal concentrations of **HClO** and **CN⁻**, and that no **ClO⁻** or **HCN** is initially present, which of the following best describes the equilibrium system?

- The forward reaction is favored at equilibrium.
- Appreciable quantities of all species are present at equilibrium.
- The reverse reaction is favored at equilibrium.

Question 10 Write the **equilibrium constant expression**, K, for the following reactions:

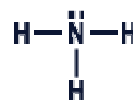
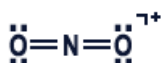
9 Points



Question 11 Which of the following molecules has the smallest bond angle?

5 Points

Circle your choice.



A

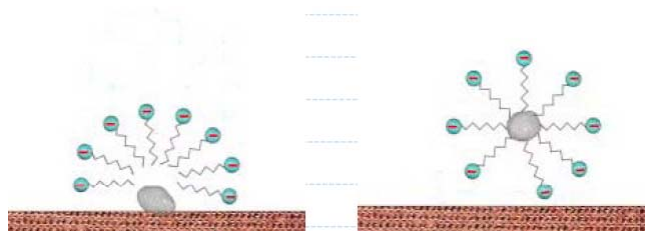
B

C

D

Question 12 In our discussion on the consequences of molecular polarity, the depiction below was used to discuss:

5 Points



a) Fabric softeners

b) Micelle actions

c) Membranes

d) The dissolution process

e) Detergents

f) EDTA use in salad dressings

g) Lead poisoning

h) Chelating therapy.

Exam II Score