SID

Last Key

First Answer

Question 1 8 Points

To answer the questions, interpret the following Lewis diagram for SO2

a) The number of lone pair on central atom

b) The number of **single** bond(s)

c) The number of **double** bond(s)

d) The number of equivalent Lewis structures

Question 2 8 Points

Draw a Lewis structure for each of the following where the central atom obeys the octet rule.

02

Carbon dioxide

CIO3

F₂CO

Question 3 6 Points

On the rough work paper provided draw a Lewis structure for NO2 in which the central N atom obeys the octet rule, and answer the questions on the right based on your drawing.

- a) The number of unshared pairs (lone pairs) on the central N atom is:
- b) The central N atom forms ____ single bonds.
- c) The central N atom forms ____ double bonds.

Question 4 8 Points

Draw a Lewis structure for each of the following organic molecules.

C₃H₈

HCOOH

CH₃COCH₃

CH₃COONH₂



O₃ has resonance structures - draw them.

Question 6

8 Points

What is the **name** of the compound with the formula:

- a) N_2O
- b) BBr_3

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What is the **formula** for:

- a) Phosphorus pentachloride
- b) Sulfur hexafluoride



Question 7

6 Points

$$H - C \equiv C - C - C - H$$
 $1 \quad 1 \quad 1$
 $1 \quad 1 \quad 1$

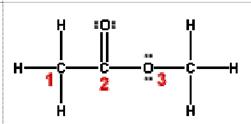
What is the **electron pair geometry** about:

- a) Atom 1:
- b) Atom 2:

c) Atom 3:

Question 8

6 Points



What is the **predicted bond angle** about:

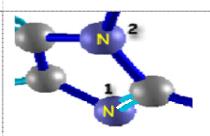
a) Atom 1:

b) Atom 2:

c) Atom 3:

Question 9

4 Points



What is the predicted bond angle about the following atoms?

- a) Nitrogen 1
- b) Nitrogen 2

Question 10

6 Points

The Lewis Dot Structure for NOCI is depicted on the right.

- a) The electron pair geometry around N is:
- b) The molecular geometry around N is:

Trigonal planer

Question 11	The electron-pair geometry around the S atom in SBr ₂ ? <u>Tetrahedron</u> . There		
8 Points	is/are $\frac{\lambda}{\lambda}$ lone pair(s) around the central atom, so the molecular geometry of the		
	SBr2 molecule is predicted to be Omgwa	7/Bent (~109°)	
	SBr ₂ is (Polar/Nonpo	lar)	
Question 12 4 Points	In our discussion on the consequences of mused to discuss:	nolecular polarity, the data shown below was	
	Solubility of Some	a) Membranes	
	Common Substances Compound Solubility in H₂O	b) Micelle action	
	g/100mL O ₂ 4.5x10 ⁻³ 18°C	c) Fabric softeners	
	N ₂ 2.0x10 ⁻³ 18°C	d) Like dissolves like	
	NH₃ 89.5 0°C CO₂ 0.179 18°C	e) Detergents	
	HCl 72.1 20°C		
Question 13 4 Points	ClO⁻(aq) + H₂O(l)⇔ HClO(aq) + OH⁻(aq)	K = 2.86×10⁻⁷ at 298K.	
	Assuming you start with CIO and no HCIO	or OH -, circle those of the following that	
	best describes the equilibrium system?		
	a) The reverse reaction is favored at e	quilibrium.	
	b) Appreciable quantities of all species	s are present at equilibrium.	
	c) The forward reaction is favored at a	equilibrium.	
	d) Very little HClO will be present at e	quilibrium.	
	Write the equilibrium constant expression	, K, for the following reactions:	
6 Points	a) 2 NOCl(s) ⇔ 2 NO(g) + Cl₂(g)	K = [No] [Q2]	
	b) HF(aq) + H₂O(I) ⇔ H₃O⁺(aq) + F⁻(aq)	K= CH30+J[F-J [HF]	
Question 15 4 Points	Consider the following system at equilibriun $H_2(g) + I_2(g)$	n a† 698K: (g) ⇔ 2HI(g)	
	When some $\mathbf{I}_2(\mathbf{g})$ is added to the equilibriur		
	The reaction must:	The concentration of H ₂ will:	
	a) Run in the forward direction.	a) Increase	
	b) Run in the reverse direction.	b) Remain the same	
	c) Remain the same .	c) Decrease	

Question 16	HCN is a weak acid -		
4 Points	$HCN(aq) + H_2O(1) \Leftrightarrow H_3O^+ + CN^-$		
	When some \mathbf{OH}^{-} is added to the equilibrium system at constant temperature:		
	The reaction must:	The concentration of CN - will:	
	d) Run in the forward direction.	d) Increase	
	e) Run in the reverse direction.	e) Remain the same	
	f) Remain the same .	f) Decrease	
Question 17 4 Points	The production of ammonia is an exothermic process - $N_2(g) + 3H_2(g) \Leftrightarrow 2NH_3(g)$		
	The production of NH_3 at equilibrium is facilitated by:		
	□ Removing N₂(g)	✓ Cooling the reaction	
	✓ Adding H₂(q)	☐ Heating the reaction	