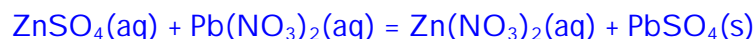


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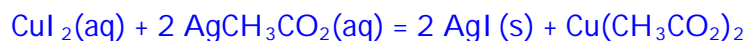
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Question 1
(6 points)

1. When aqueous solutions of **zinc(II) sulfate** and **lead(II) nitrate** are combined a precipitate results. What is the formula for the precipitate?



2. When aqueous solutions of **copper(II) iodide** and **silver(I) acetate** are combined a precipitate results. What is the formula for the precipitate?

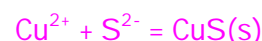
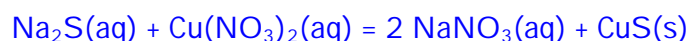


Question 2
(16 Points)

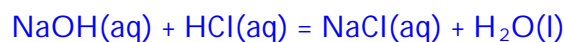
1. Consider the reaction when aqueous solutions of **NiNO₃** and **Ba(OH)₂** are combined. The net ionic equation for this reaction is:



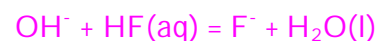
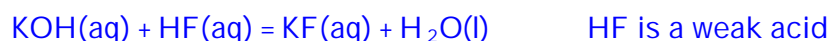
2. Consider the reaction when aqueous solutions of **sodium sulfide** and **copper(II) nitrate** are combined. The net ionic equation for this reaction is:



3. Write a net ionic equation for the reaction that occurs when aqueous solutions of **NaOH** and **HCl** are combined.



4. Write a net ionic equation for the reaction that occurs when aqueous solutions of **KOH** and **HF** are combined.



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Question 3
(9 Points)

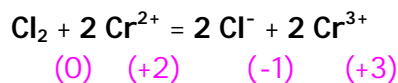
What is the oxidation state of:

nitrogen in NO_3^- ? +5 carbon in $\text{H}_2\text{C}_2\text{O}_4$? +3
oxygen in O_2 ? 0

Do Not
Write Here

Question 4
(12 Points)

Identify the species oxidized, the species reduced, the oxidizing agent and the reducing agent in the following electron transfer reaction.



Do Not
Write Here

- species oxidized: Cr^{2+}
- species reduced: Cl_2
- oxidizing agent: Cl_2
- reducing agent: Cr^{2+}
- During the reaction, electrons are transferred from Cr^{2+} to Cl_2 .

Question 5
(16 Points)

- What is the **complete** electron configuration for the **lithium** atom?

$1s^2 2s^1$

- What is the **complete** electron configuration for the **aluminum ion**?

$1s^2 2s^2 2p^6$

- What is the **valence** electron configuration for the **silicon** atom?

$3s^2 3p^2$

- What is the **valence** electron configuration for the **chloride ion**?

$3s^2 3p^6$

- A main group element with the valence electron configuration $2s^2 2p^3$ is in periodic group **5A**. It forms a monatomic ion with a charge of **-3**.
- A main group element with the valence electron configuration $2s^1$ is in periodic group **1A**. It forms a monatomic ion with a charge of **+1**.

Do Not
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Name: _____

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Question 6 Consider the following elements:
(8 Points)

Sb, As, Bi, P

1. Which would you expect to have the smallest atomic radius? P
2. Which would you expect to be most metallic? Bi
3. Which would you expect to have the largest ionization energy? P
4. Which would you expect to be least electronegative? Bi

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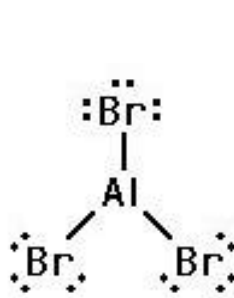
Consider the following elements:

Se, Ge, As, Br

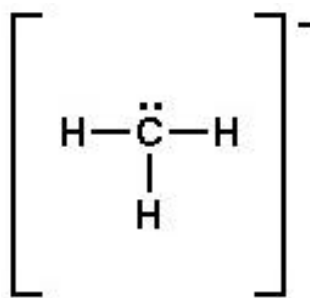
1. Which would you expect to have the smallest atomic radius? Br
2. Which would you expect to be most metallic? Ge
3. Which would you expect to have the smallest ionization energy? Ge
4. Which would you expect to be most electronegative? Br

Question 7 From the Lewis diagrams of the species given, pick all of those in which the central atom obeys the octet rule.
(8 Points)

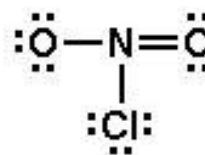
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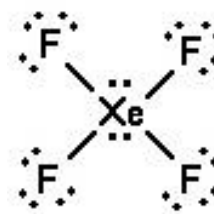
Yes No



Yes No



Yes No

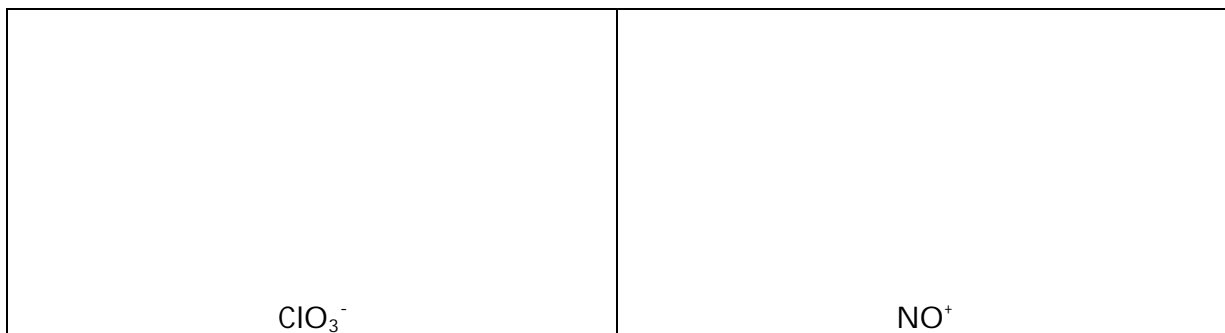


Yes No

Question 8 Draw Lewis structures for ClO_3^- and NO^+ .

(8 Points)

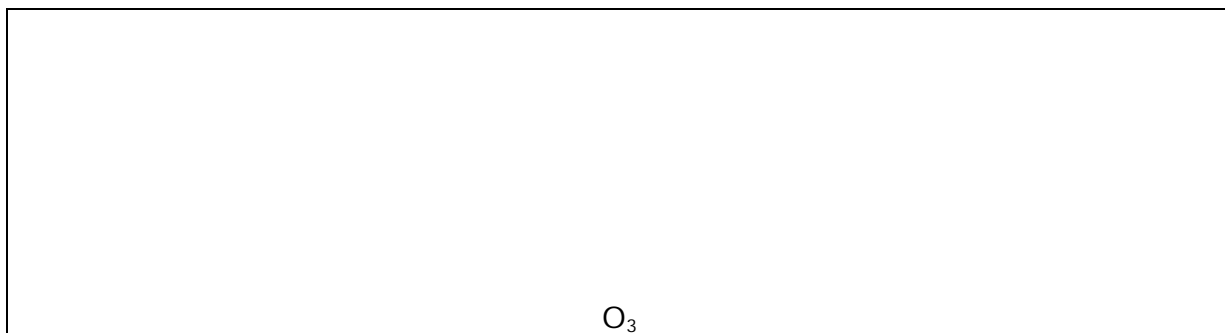
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Question 9 Draw Lewis structure for **Ozone** and any resonance structures that it may have?

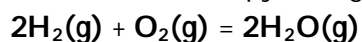
(9 Points)

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Question 10 Using average bond energies estimate the enthalpy change for the following reaction:

(8 Points)



$$\begin{aligned}\Delta H &= \text{Bonds Broken} - \text{Bonds Formed} \\ &= \{ 2(\text{H-H}) + (\text{O}=\text{O}) \} - \{ 4(\text{O-H}) \} \\ &= \{ 2(436) + (498) \} - \{ 4(464) \} \\ &= \{ 872 + 498 \} - \{ 1856 \} \\ &= -486 \text{ kJ}\end{aligned}$$

Do Not
Write Here

The reaction is (Circle One): **Exothermic** Endothermic

<u>Score:</u> Do Not Write Here	<u>Note:</u> Do Not Write Here
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