

MULTIPLE CHOICE QUESTIONSSelect the **one best answer** for each question.**A.** Which of the following statements is true?

- | | |
|---|--|
| (1) Group 15 atoms tend to gain three electrons to form 3 ⁻ ions | (5) Group 1 atoms tend to lose one electron to form 1 ⁻ ions |
| (2) Group 16 atoms tend to lose two electrons to form 2 ⁺ ions | (6) Group 13 atoms tend to gain five electrons to form 5 ⁻ ions |
| (3) Group 17 atoms tend to gain one electron to form 1 ⁺ ions | (7) More than one statement is true |
| (4) Group 2 atoms tend to lose two electrons to form 2 ⁻ ions | (8) None of the previous statements are true |

B. Which of the following is the correct Lewis dot structure for germanium?

- | | |
|---|---|
| (1) $\begin{array}{c} \cdot \\ \text{Ge} \\ \cdot \end{array}$ | (4) $\begin{array}{c} \cdot \\ \cdot \\ \text{Ge} \\ \cdot \\ \cdot \end{array}$ |
| (2) $\begin{array}{c} \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \end{array} \text{Ga} \cdot$ | (5) $\begin{array}{c} \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \end{array} \text{Ga} \cdot$ |
| (3) $\begin{array}{c} \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \end{array} \text{Ga}$ | (6) $\begin{array}{c} \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \cdot \end{array} \text{Ge} \cdot$ |

C. Boron reacts with oxygen to form a solid. The correct formula for this solid is

- | | |
|-----------------------|---|
| (1) BO | (5) BrO ₂ |
| (2) B ₂ O | (6) B ₂ O ₃ |
| (3) BO ₂ | (7) Br ₂ O ₃ |
| (4) Br ₂ O | (8) none of the previous answers is correct |

D. The correct name for CoF₂ is

- | | |
|-------------------------|-------------------------|
| (1) Copper fluoride | (4) Cobalt(II) fluoride |
| (2) Copper(II) fluoride | (5) Copper difluoride |
| (3) Cobalt difluoride | (6) Cobalt fluoride |

E. The formula for the solid present after aluminum phosphate and sodium sulfate are mixed in water is

- | | |
|---|---|
| (1) Al ₃ (SO ₄) ₂ | (4) Al ₂ (PO ₄) ₃ |
| (2) AlPO ₄ | (5) Na ₂ SO ₄ |
| (3) Na ₃ PO ₄ | (6) Al ₂ (SO ₄) ₃ |

F. The correct number of protons, neutrons and electrons (**in that order**) in the ⁵³V⁴⁺ ion is

- | | |
|----------------|---|
| (1) 23, 53, 19 | (5) 19, 30, 23 |
| (2) 23, 30, 23 | (6) 19, 53, 27 |
| (3) 23, 30, 19 | (7) 19, 19, 34 |
| (4) 19, 34, 19 | (8) none of the previous answers is correct |

- G. Consider the following three compounds: A) $\text{Fe}_2(\text{CO}_3)_3$ B) $\text{Ba}(\text{ClO}_3)_2$ C) $\text{Li}_2\text{C}_2\text{O}_4$. Select the answer below that contains the correct names for compounds A – C.

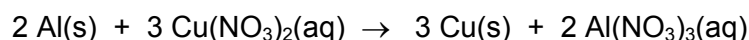
	A	B	C
(1)	iron(III) tricarbonat	barium chlorate	lithium dioxalate
(2)	diiron tricarbonat	barium(II) diperchlorate	dilithium chromate
(3)	iron(II) carbonat	barium chlorate	dilithium oxalate
(4)	iron(III) carbonat	barium chlorate	lithium oxalate
(5)	Iron(III) carbonat	barium perchlorate	dilithium chromate

- H. Determine the formula of the compound formed by each pair of ions. Select the answer below with the correct formulas for compounds A – F.

	cyanide	chromate	sulfite
Mg ion	A	B	C
Cr(III)	D	E	F

	A	B	C	D	E	F
(1)	MgCN	MgCr_2O_7	MgSO_3	$\text{Cr}(\text{CN})_3$	$\text{Cr}_3(\text{Cr}_2\text{O}_7)_2$	$\text{Cr}_3(\text{SO}_3)_2$
(2)	$\text{Mg}(\text{CN})$	$\text{Mg}_2(\text{Cr}_2\text{O}_7)_3$	MgSO_4	$\text{Cr}_2(\text{CN})_3$	$\text{Cr}_3(\text{Cr}_2\text{O}_7)_2$	$\text{Cr}_3(\text{SO}_4)_2$
(3)	$\text{Mg}_2(\text{CN})$	$\text{Mg}_3(\text{Cr}_2\text{O}_7)_2$	MgSO_3	$\text{Cr}(\text{CN})_2$	CrCr_2O_7	CrSO_3
(4)	$\text{Mg}(\text{CN})_2$	MgCrO_4	MgSO_4	$\text{Cr}(\text{CN})_2$	$\text{Cr}_2(\text{CrO}_4)_3$	CrSO_4
(5)	$\text{Mg}(\text{CN})_2$	MgCrO_4	MgSO_3	$\text{Cr}(\text{CN})_3$	$\text{Cr}_2(\text{CrO}_4)_3$	$\text{Cr}_2(\text{SO}_3)_3$
(6)	none of the previous answers is correct					

- I. Properly classify the reaction below:



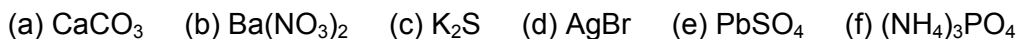
- | | |
|-------------------------|-------------------------------------|
| (1) single replacement | (4) double replacement |
| (2) decomposition | (5) precipitation |
| (3) oxidation-reduction | (6) more than one answer is correct |

- J. Properly classify the reaction below:



- | | |
|------------------------|-------------------------------------|
| (1) combination | (5) precipitation |
| (2) single replacement | (6) acid-base neutralization |
| (3) double replacement | (7) more than one answer is correct |
| (4) decomposition | |

- K. Which of the following substances will be insoluble in water?



- | | |
|--------------------------------------|----------------------------------|
| (1) all will be insoluble | (4) a, c and e will be insoluble |
| (2) a, d, and e will be insoluble | (5) a, d and f will be insoluble |
| (3) b, c, d, and e will be insoluble | (6) none will be insoluble |

L. When aqueous solutions of iron(III) sulfate and silver nitrate are mixed, a white precipitate forms. In the balanced net ionic equation, the coefficient associated with the silver ion is

- (1) 1 (4) 6
(2) 2 (5) 0
(3) 3 (6) none of the previous answers is correct

M. Potassium carbonate reacts with aluminum chloride. In the balanced net ionic equation, the coefficient associated with the chloride ion is

- (1) 1 (5) 6
(2) 2 (6) 8
(3) 3 (7) 0
(4) 4 (8) none of the previous answers is correct

PROBLEM QUESTION: You must show your work to receive any credit on this problem. This problem is worth 2 points. As usual, sig figs and units are important.

Barium is a soft, silvery metal. Suppose you take a large block of barium and cut out a perfect cube measuring 15.00 mm on each side and add it to a large volume of water. Assuming all of the barium reacts with water to form barium hydroxide and hydrogen gas, how many hydroxide ions were formed? The density of barium = 3.510 g/mL.

ANSWER LIST – List your answers here for grading. Check to make sure they are correct. Also, be sure to write your name in the space provided.

Multiple choice:

No.	A	B	C	D	E	F	G	H	I	J	K	L	M
Answer													

Problem Question: _____

Name: _____