Question #: 1

Select the two ionic compounds.

A. NaNO₂
B. H₂O
C. NO₂⁻
D. NH₄Cl

Question #: 2

Which statement is true regarding beryllium?

A. Beryllium is a nonmetal with a common ionic charge of 2⁻.
B. Beryllium is a metal with a common ionic charge of 2⁺.
C. Beryllium is a metal with a common ionic charge of 2⁻.
D. Beryllium is a nonmetal with a common ionic charge of 2⁺.

Question #: 3

Which one is the nitrite ion?

A. NO₂⁻
B. N³⁻
C. NO₂⁻
D. NO₃⁻
E. HNO₂
Question #: 4

What is the formula of the ionic compound formed from barium and iodine?

A. Ba₂I₃
B. Ba₂I₂
C. BaI₂
D. BaI

Question #: 5

What is the formula for nickel(II) oxide?

A. NiO
B. NiO₂
C. Ni₂O
D. Ni₂O₂

Question #: 6

What is the name of Li₂CO₃?

A. lithium carbonate
B. lithium(I) carbonate
C. lithium(I) carbonite
D. lithium carbonite

Question #: 7

What is the chemical formula of tetraphosphorus hexoxide? Enter the formula without subscripts or spaces. Use parentheses if needed, e.g., C₄H₄O₂ or (NH₄)₂S.

1. ___________
**Question #**: 8

Select the formula for dichlorine heptoxide.

A. Cl$_5$O$_8$
B. Cl$_2$O$_{10}$
C. Cl$_2$O$_7$
D. Cl$_7$O$_2$
E. ClO

**Question #**: 9

Hydrosulfuric acid is a binary acid that gives off a foul odor smelling of rotten eggs. Give the formula for hydrosulfuric acid. Enter the formula without subscripts or spaces. Use parentheses if needed, e.g., C$_4$H$_4$O$_2$ or (NH$_4$)$_2$S$\_1$ (aq)

1. __________

**Question #**: 10

Which one contains $6.022 \times 10^{23}$ atoms?

A. 6.941 grams of lithium
B. 58.933 grams of sodium
C. 4.00 grams of beryllium
D. 12.011 grams of boron
**Question #: 11**

How many moles of calcium are represented by $6.022 \times 10^{23}$ atoms? Report your answer with **two** significant figures. Do **NOT** include units in your answer. Do **NOT** use scientific notation.

1. __________

**Question #: 12**

What is the mass in grams of 0.115 moles of aluminum? Report your answer with **three** significant figures. Do **NOT** include units in your answer. Do **NOT** use scientific notation.

1. __________

**Question #: 13**

What is the formula mass of LiClO$_3$? Report your answer with **three** significant figures. Do **NOT** include unit in your answer. Do **NOT** use scientific notation.

1. __________

**Question #: 14**

138 grams of magnesium chloride (95.12 g/mol) contains __________ moles of magnesium chloride. Report your answer with **three** significant figures. Do **NOT** include units in your answer. Do **NOT** use scientific notation.

1. __________
Question #: 15

How many molecules of SO$_2$ are contained in 0.0357 moles?

A. $1.68 \times 10^{25}$ molecules
B. $2.15 \times 10^{22}$ molecules
C. $6.022 \times 10^{23}$ molecules
D. $5.93 \times 10^{-26}$ molecules

Question #: 16

What is the mass percent composition of lithium in Li$_3$PO$_4$?

A. 26.75 %
B. 17.98 %
C. 30.72 %
D. 55.27 %

Question #: 17

A manganese oxide contains 30.403% of oxygen. What is the empirical formula of the oxide?

A. MnO$_2$
B. MnO$_3$
C. Mn$_2$O$_7$
D. Mn$_2$O$_3$
Question #: 18

Determine the molarity of a solution containing 13.9 g of CaCl\(_2\) in 2.75 L of solution.

A. 5.05 M  
B. 22.1 M  
C. 0.0455 M  
D. 0.291 M

Question #: 19

What volume of a 0.123 M solution of NaCl contains 0.537 g of NaCl? (NaCl = 58.44 g/mol)

A. 66.1 mL  
B. 74.7 mL  
C. 43.7 mL  
D. 91.9 mL

Question #: 20

If 32.50 mL of 5.05 M NaH\(_2\)PO\(_4\) solution is diluted to 100.0 mL, what is the final concentration of NaH\(_2\)PO\(_4\)? Report your answer with three significant figures. Do NOT include units in your answer.

1. ________ M
Question #: 21

Balance this chemical equation with the smallest possible **whole numbers**. Fill in the blanks with the proper coefficients. If the coefficient is 1, fill in 1.

\[ \text{1} \text{C}_6\text{H}_{12}\text{O}_6(s) + \text{2} \text{O}_2(g) \rightarrow \text{3} \text{CO}_2(g) + \text{4} \text{H}_2\text{O}(g) \]

1. ________
2. ________
3. ________
4. ________

Question #: 22

Select the **two** compounds that are insoluble in water.

A. AgI
B. K_2S
C. Ba(OH)_2
D. Fe(NO_3)_3
E. BaCO_3

Question #: 23

Which one is a weak electrolyte?

A. HBr
B. HNO_3
C. H_2CO_3
D. RbOH
Question #: 24

An ionic compound is a(n) _______. When it dissolves in water, it ___________.

A. electrolyte, stays together as a compound  
B. electrolyte, breaks apart into ions  
C. nonelectrolyte, stays together as a compound  
D. nonelectrolyte, breaks apart into ions

Question #: 25

Which mixture produces a precipitate?

A. Cu(NO₃)₂(aq) + K₂SO₄(aq) → ?  
B. 2 LiCl(aq) + Hg₂(NO₃)₂(aq) → ?  
C. KCl(aq) + MgBr₂(aq) → ?  
D. HF(aq) + NaOH(aq) → ?

Question #: 26

What is the **net ionic** equation for the reaction that occurs when aqueous solutions of Cu(NO₃)₂ and K₂CO₃ are mixed?

A. Cu²⁺(aq) + CO₃²⁻(aq) → CuCO₃(s)  
B. 2Cu⁺(aq) + CO₃²⁻(aq) → Cu₂CO₃(s)  
C. Cu²⁺(aq) + CO₃²⁻(aq) + 2K⁺(aq) + 2NO₃⁻(aq) → CuCO₃(s) + 2 KNO₃(s)  
D. Cu²⁺(aq) + CO₃²⁻(aq) + 2K⁺(aq) + 2NO₃⁻(aq) → CuCO₃(s) + 2K⁺(aq) + 2NO₃⁻(aq)
Question #: 27

Which one is **NOT** a strong acid?

A. H₂SO₄  
B. HCl  
C. HF  
D. HI

Question #: 28

Which equation represents the ionization of a strong base in water?

A. KClO₄(aq) → K⁺(aq) + ClO₄⁻(aq)  
B. HClO₄(aq) → H⁺(aq) + ClO₄⁻(aq)  
C. KOH(aq) → K⁺(aq) + OH⁻(aq)  
D. KOH(aq) + HClO₄(aq) → H₂O(aq) + KClO₄(aq)

Question #: 29

When dissolved in water, NaOH behaves as

A. an acid that forms Na⁺ and OH⁻ ions.  
B. an acid that forms NaO⁻ and H⁺ ions.  
C. a base that forms Na⁺ and OH⁻ ions.  
D. a base that forms NaO⁻ and H⁺ ions.

Question #: 30

Select the choice below that completes the **balanced** reaction.

2HNO₃(aq) + Ca(OH)₂(aq) → _______ + _______

A. Ca(NO₃)₂(aq) + 2H₂O(l)  
B. CaH(aq) + 2HNO₄(aq)  
C. H₂NO₃(aq) + CaOH(aq)  
D. Ca(s) + 2H₂O(l)
Question #1

Select the two ionic compounds.

✓ A. NaNO₂
  B. H₂O
  C. NO₂
  ✓ D. NH₄Cl

Question #2

Which statement is true regarding beryllium?

A. Beryllium is a nonmetal with a common ionic charge of 2−.
  ✓ B. Beryllium is a metal with a common ionic charge of 2+.
C. Beryllium is a metal with a common ionic charge of 2−.
D. Beryllium is a nonmetal with a common ionic charge of 2+.

**Question #**: 3

Which one is the nitrite ion?

A. NO₂
B. N³⁻^2
✓C. NO₂⁻
D. NO₃⁻
E. HNO₂

**Question #**: 4

What is the formula of the ionic compound formed from barium and iodine?

A. Ba₂I₃
B. Ba₂I₂
✓C. BaI₂
D. BaI

**Question #**: 5

What is the formula for nickel(II) oxide?

✓A. NiO
B. NiO₂
C. Ni₂O
D. Ni₂O₂

**Question #**: 6

What is the name of Li₂CO₃?
Question #: 7

What is the chemical formula of tetraphosphorus hexoxide?
Enter the formula without subscripts or spaces. Use parentheses if needed, e.g., C₄H₄O₂ or (NH₄)₂S.

1. P₄O₆

Question #: 8

Select the formula for dichlorine heptoxide.

A. Cl₅O₈
B. Cl₂O₁₀
C. Cl₂O₇
✓
D. Cl₇O₂
E. ClO

Question #: 9

Hydrosulfuric acid is a binary acid that gives off a foul odor smelling of rotten eggs. Give the formula for hydrosulfuric acid.
Enter the formula without subscripts or spaces. Use parentheses if needed, e.g., C₄H₄O₂ or (NH₄)₂S

1 (aq)

1. H₂S|SH₂|
Question #: 10

Which one contains $6.022 \times 10^{23}$ atoms?

✓ A. 6.941 grams of lithium  
    B. 58.933 grams of sodium  
    C. 4.00 grams of beryllium  
    D. 12.011 grams of boron

Question #: 11

How many moles of calcium are represented by $6.022 \times 10^{22}$ atoms?
Report your answer with two significant figures. Do NOT include units in your answer. Do NOT use scientific notation.

1 moles

1. 0.10

Question #: 12

What is the mass in grams of 0.115 moles of aluminum?
Report your answer with three significant figures. Do NOT include units in your answer. Do NOT use scientific notation.

1 grams

1. 3.10

Question #: 13

What is the formula mass of LiClO$_3$?
Report your answer with three significant figures. Do NOT include unit in your answer. Do NOT use scientific notation.

1 g/mol

1. 90.4|90.3|90.5|90.2|90.6|
138 grams of magnesium chloride (95.12 g/mol) contains \( \frac{138}{95.12} \) moles of magnesium chloride. Report your answer with \( \text{three} \) significant figures. Do \( \text{NOT} \) include units in your answer. Do \( \text{NOT} \) use scientific notation.

1. 1.45|1.44|1.43|1.46|1.47|

How many molecules of \( \text{SO}_2 \) are contained in 0.0357 moles?

A. \( 1.68 \times 10^{25} \) molecules  
B. \( 2.15 \times 10^{22} \) molecules  
C. \( 6.022 \times 10^{23} \) molecules  
D. \( 5.93 \times 10^{-26} \) molecules

What is the mass percent composition of lithium in \( \text{Li}_3\text{PO}_4 \)?

A. 26.75 %  
B. 17.98 %  
C. 30.72 %  
D. 55.27 %

A manganese oxide contains 30.403% of oxygen. What is the empirical formula of the oxide?

A. \( \text{MnO}_2 \)  
B. \( \text{MnO}_3 \)  
C. \( \text{Mn}_2\text{O}_7 \)  
D. \( \text{Mn}_2\text{O}_3 \)
Question #: 18

Determine the molarity of a solution containing 13.9 g of CaCl₂ in 2.75 L of solution.

A. 5.05 M
B. 22.1 M
✓C. 0.0455 M
D. 0.291 M

Question #: 19

What volume of a 0.123 M solution of NaCl contains 0.537 g of NaCl? (NaCl = 58.44 g/mol)

A. 66.1 mL
✓B. 74.7 mL
C. 43.7 mL
D. 91.9 mL

Question #: 20

If 32.50 mL of 5.05 M NaH₂PO₄ solution is diluted to 100.0 mL, what is the final concentration of NaH₂PO₄?

Report your answer with three significant figures. Do NOT include units in your answer.

1. 1.64

Question #: 21
Balance this chemical equation with the smallest possible whole numbers. Fill in the blanks with the proper coefficients. If the coefficient is 1, fill in 1.

\[ \underline{1} \text{ C}_6\text{H}_{12}\text{O}_6(s) + \underline{2} \text{ O}_2(g) \rightarrow \underline{3} \text{ CO}_2(g) + \underline{4} \text{ H}_2\text{O}(g) \]

1. 1
2. 6
3. 6
4. 6

Question #: 22

Select the two compounds that are insoluble in water.

✓ A. AgI  
B. K_2 S  
C. Ba(OH)_2  
D. Fe(NO_3)_3  
✓ E. BaCO_3

Question #: 23

Which one is a weak electrolyte?

A. HBr  
B. HNO_3  
✓ C. H_2CO_3  
D. RbOH

Question #: 24

An ionic compound is a(n) _______. When it dissolves in water, it _________.

A. electrolyte, stays together as a compound  
✓ B. electrolyte, breaks apart into ions  
C. nonelectrolyte, stays together as a compound
D. nonelectrolyte, breaks apart into ions

**Question #: 25**

Which mixture produces a precipitate?

A. Cu(NO$_3$)$_2$(aq) + K$_2$SO$_4$(aq) →?
✓B. 2 LiCl(aq) + Hg$_2$(NO$_3$)$_2$(aq) →?
C. KCl(aq) + MgBr$_2$(aq) →?
D. HF(aq) + NaOH(aq) →?

**Question #: 26**

What is the **net ionic** equation for the reaction that occurs when aqueous solutions of Cu(NO$_3$)$_2$ and K$_2$CO$_3$ are mixed?

✓A. Cu$^{2+}$(aq) + CO$_3^{2-}$(aq) → CuCO$_3$(s)
B. 2Cu$^+$(aq) + CO$_3^{2-}$(aq) → Cu$_2$CO$_3$(s)
C. Cu$^{2+}$(aq) + CO$_3^{2-}$(aq) + 2K$^+$(aq) + 2NO$_3$–(aq) → CuCO$_3$(s) + 2 KNO$_3$(s)
D. Cu$^{2+}$(aq) + CO$_3^{2-}$(aq) + 2K$^+$(aq) + 2NO$_3$–(aq) → CuCO$_3$(s) + 2K$^+$(aq) + 2NO$_3$–(aq)

**Question #: 27**

Which one is **NOT** a strong acid?

A. H$_2$SO$_4$
B. HCl
✓C. HF
D. HI

**Question #: 28**

Which equation represents the ionization of a strong base in water?
A. $\text{KClO}_4(aq) \rightarrow \text{K}^+(aq) + \text{ClO}_4^-(aq)$
B. $\text{HClO}_4(aq) \rightarrow \text{H}^+(aq) + \text{ClO}_4^-(aq)$
✓C. $\text{KOH}(aq) \rightarrow \text{K}^+(aq) + \text{OH}^- (aq)$
D. $\text{KOH}(aq) + \text{HClO}_4(aq) \rightarrow \text{H}_2\text{O}(aq) + \text{KClO}_4(aq)$

**Question #: 29**

When dissolved in water, NaOH behaves as

A. an acid that forms Na$^+$ and OH$^-$ ions.
B. an acid that forms NaO$^-$ and H$^+$ ions.
✓C. a base that forms Na$^+$ and OH$^-$ ions.
D. a base that forms NaO$^-$ and H$^+$ ions.

**Question #: 30**

Select the choice below that completes the balanced reaction.

$2\text{HNO}_3(aq) + \text{Ca(OH)}_2(aq) \rightarrow \underline{\quad} + \underline{\quad}$

✓A. $\text{Ca(NO}_3)_2(aq) + 2\text{H}_2\text{O}(l)$
B. $\text{CaH}(aq) + 2\text{HNO}_4(aq)$
C. $\text{H}_2\text{NO}_4(aq) + \text{CaOH}(aq)$
D. $\text{Ca(s)} + 2\text{H}_2\text{O}(l)$