

Exam #2 General Chemistry I - CHEM115 Fall 2006 (115e2f06)

Multiple Choice

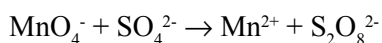
Identify the letter of the choice that best completes the statement or answers the question.

- _____ 1. Calcium sulfate precipitates from aqueous solutions as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. When it is heated at 235°C for three hours, all of the water of hydration is lost. If 172.17 g of the dihydrate is heated as described, the mass of the solid produced will be
- 118.13 g
 - 136.14 g
 - 154.16 g
 - 172.17 g
 - none of these
- _____ 2. In the conversion of bromate ion to bromide ion in acid solution,
- bromine is oxidized
 - bromine is reduced
 - oxygen is oxidized
 - oxygen is reduced
 - More than one of these answers are correct.
- _____ 3. A compound that dissolves in water to yield only a small concentration of ions is called
- a nonelectrolyte.
 - a weak electrolyte.
 - a strong electrolyte.
 - a saturated electrolyte.
 - none of these
- _____ 4. If a solution containing 4.000 g of NaOH is exactly neutralized by 80.00 mL of an aqueous HCl solution, the molarity of the HCl solution must have been
- 0.001250 m
 - 0.001370 m
 - 1.250 m
 - 1.370 m
 - none of these
- _____ 5. A crystalline compound of formula $\text{Mg}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ loses some of its water of hydration when it is heated, but undergoes no other chemical changes. When a 10.0 g sample is heated in this way, the residue weighs 7.19 g. What is the formula of the residue?
- $\text{Mg}_2(\text{NO}_3)_2 \cdot 11\text{H}_2\text{O}$
 - $\text{Mg}(\text{NO}_3)_2 \cdot 4\text{H}_2\text{O}$
 - $\text{Mg}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$
 - $\text{Mg}(\text{NO}_3)_2 \cdot 2\text{H}_2\text{O}$
 - $\text{Mg}(\text{NO}_3)_2 \cdot \text{H}_2\text{O}$
- _____ 6. An oxidizing agent is a substance that
- is oxidized
 - causes oxidation
 - causes reduction
 - provides oxygen
 - none of these

- ___ 7. After a chemical reaction was completed, the product was carefully weighed and the mass recorded. In order to calculate the percentage yield for the reaction, what additional information is required?
- the theoretical yield of the product
 - the actual yield of the product
 - the molar mass of the product
 - all of these
 - none of these

- ___ 8. Consider the unbalanced chemical equation, $F_2 + H_2O \rightarrow OF_2 + HF$. When the reaction is balanced with smallest integer coefficients, the coefficient for H_2O is
- 1
 - 2
 - 3
 - 4
 - none of these

- ___ 9. Which element is oxidized in the reaction (unbalanced),



- Mn
 - O
 - S
 - None; this is not a redox reaction.
 - This cannot be determined without balancing the equation.
- ___ 10. When CrO_4^{2-} is converted to Cr^{3+} , _____ electrons are _____ by each chromium atom.
- 5, lost
 - 5, gained
 - 3, lost
 - 3, gained
 - none of these
- ___ 11. A precipitate is observed to form when an aqueous solution of potassium phosphate is mixed with an aqueous solution of magnesium chloride. The net ionic equation is
- $3 Mg^{2+}(aq) + 2 PO_4^{3-} \rightarrow Mg_3(PO_4)_2(s)$
 - $Mg^{2+}(aq) + 2 Cl^-(aq) \rightarrow MgCl_2(s)$
 - $3 K^+(aq) + PO_4^{3-}(aq) \rightarrow K_3PO_4(s)$
 - $K^+(aq) + Cl^-(aq) \rightarrow KCl(s)$
 - none of these
- ___ 12. When nitric acid is added to calcium carbonate, a reaction occurs producing
- $Ca^{2+}(aq)$
 - $CO_2(g)$
 - $H_2O(l)$
 - all of these
 - none of these
- ___ 13. In the balanced chemical reaction, $XeF_4(g) + 2 H_2O(g) \rightarrow Xe(g) + 4 HF(g) + O_2(g)$, what mass of water is required to react completely with 10.0 g of XeF_4 ?
- 0.87 g
 - 1.20 g

- c. 1.74 g
 - d. 2.40 g
 - e. none of these
- _____ 14. A precipitate is observed to form when an aqueous solution of potassium phosphate is mixed with an aqueous solution of magnesium chloride. The spectator ions in the process include
- a. magnesium ion
 - b. chloride ion
 - c. phosphate ion
 - d. all of these
 - e. none of these
- _____ 15. How many hydrogen atoms are present in 3.41 g of NH_3 ?
- a. 2.89×10^{22}
 - b. 3.62×10^{22}
 - c. 1.21×10^{23}
 - d. 2.41×10^{23}
 - e. none of these
- _____ 16. Borazine is a ternary compound composed of 40.31% boron, 52.18% nitrogen and 7.51% hydrogen. Determine the empirical formula for borazine.
- a. BNH_2
 - b. BN_2H_2
 - c. B_2NH_2
 - d. $\text{B}_2\text{N}_2\text{H}_3$
 - e. none of these
- _____ 17. What mass of potassium nitrate (KNO_3) is required to prepare 0.150 L of a 0.675 molar solution?
- a. 4.50 g
 - b. 6.98 g
 - c. 10.2 g
 - d. 68.2 g
 - e. none of these
- _____ 18. One mole of any substance contains Avogadro's number of
- a. atoms.
 - b. isotopes.
 - c. formula units.
 - d. All of these are possible.
 - e. none of these

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Answer Section

MULTIPLE CHOICE

1. B
2. B
3. B
4. C
5. D
6. B
7. A
8. A
9. C
10. D
11. A
12. D
13. C
14. B
15. E
16. A
17. C
18. C