**Name:** _____
**Date:** _____

# PRACTICE TEST: CHEMICAL EQUATIONS AND REACTIONS TEST


## PART 1: MULTIPLE CHOICE (1 mark each = 16 marks)

**1.** In the compound $Mg(ClO_4)_2$ there are ____ magnesium atoms:
- **a.** 0
- **b.** 1
- **c.** 2
- **d.** 3

**2.** In the compound $Mg(ClO_4)_2$ there are ____ oxygen atoms:
- **a.** 2
- **b.** 4
- **c.** 6
- **d.** 8

**3.** In the compound $Mg(ClO_4)_2$ there are ____ perchlorate **ions**:
- **a.** 1
- **b.** 2
- **c.** 4
- **d.** 8

**4.** In the compound $Mg_3(PO_3)_2$ there are ____ atoms in total:
- **a.** 8
- **b.** 9
- **c.** 10
- **d.** 11

**5.** How many atoms of oxygen are on the product side of the following **unbalanced** equations?

$$CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$$

- **a.** 2
- **b.** 3
- **c.** 6
- **d.** 8

**6.** Which of the following are true regarding the effects of increasing temperature on reacting particles?

I. Increased temperature causes more collisions to occur between reactant particles.
II. Increased temperature causes more intense collisions to occur between reactant particles.
III. Increased temperature allows reactant molecules to line up better prior to colliding with one another.
IV. Increased temperature makes the reactant particles move faster prior to colliding with one another

- **a.** I, II and III only.
- **b.** II, III, and IV only
- **c.** I, II, and IV only
- **d.** I, II, III, and IV

**7.** Which of the following correctly balances the equation:

$$Cs_2CO_3 + Mg(NO_3)_2 \rightarrow \_\_\_ CsNO_3 + \_\_\_ MgCO_3$$

- **a.** $2CsNO_3 + MgCO_3$
- **b.** $2CsNO_3 + 2MgCO_3$
- **c.** $CsNO_3 + 2MgCO_3$
- **d.** $CsNO_3 + MgCO_3$

**8.** Which of the following reactants would balance the equation: $\_\_\_\_ + 2O_2 \rightarrow CO_2 + 2H_2O$
- **a.** $CH_2$
- **b.** $2CH_2$
- **c.** $CH_4$
- **d.** $2CH_4$

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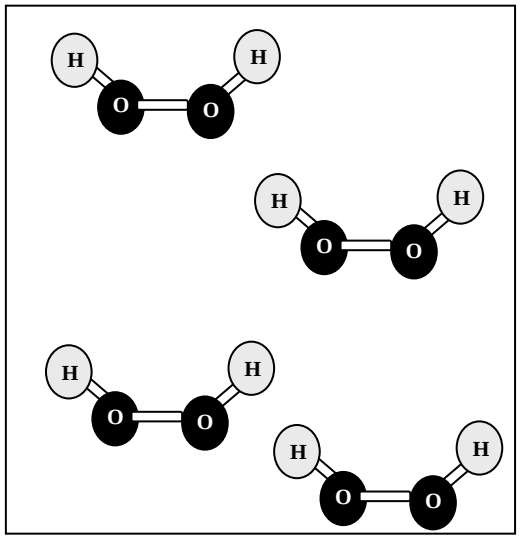
**9.** Which of the following equations is balanced?

**I.** $2KCl + Ca(NO_3)_2 \rightarrow KNO_3 + CaCl_2$
**II.** $FeCl_3 + 3KOH \rightarrow Fe(OH)_3 + 3KCl$
**III.** $2Na + H_2SO_4 \rightarrow Na_2SO_4 + H_2$

**a.** I and II only
**b.** I and III only
**c.** II and III only
**d.** I, II and III

**10.** Considering the illustration below, if four molecules of hydrogen peroxide ($H_2O_2$) undergo decomposition, how many molecules of oxygen and hydrogen will form?



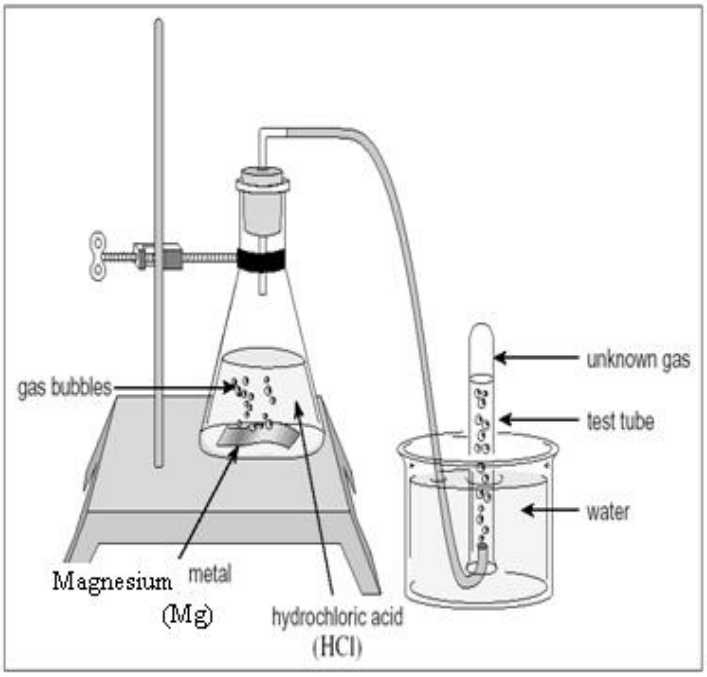
| | Oxygen Molecules | Hydrogen Molecules |
|---|---|---|
| **a.** | 1 | 1 |
| **b.** | 2 | 1 |
| **c.** | 2 | 2 |
| **d.** | 4 | 4 |

**11.** Which of the following **correctly** balances the equations:

___ $CO_2$ + ___ $H_2O \rightarrow$ ___ $C_4H_8O_4$+ ___ $O_2$

**a.** 1, 1, 1, 1
**b.** 4, 4, 1, 4
**c.** 6, 6, 1, 6
**d.** 2, 2, ½, 2

**Use the following diagram to answer question 12, 13 and 14.**




12. What are the reactants in the diagram above?

**a.** Mg and $O_2$
**b.** Mg and $H_2$
**c.** Mg and $H_2O$
**d.** Mg and HCl

13. What gas is produced in the diagram above?

**a.** a. $Cl_2$
**b.** b. $O_2$
**c.** c. $H_2$
**d.** d. Mg
**e.**

14. What is the balanced equation for the reaction in the diagram above?

a. $Mg + 2HCl \rightarrow MgH_2 + Cl_2$
b. $2Mg + 2H_2O \rightarrow O_2 + 2MgH_2$
c. $Mg + Cl_2 \rightarrow MgCl_2$
d. $Mg + 2HCl \rightarrow H_2 + MgCl_2$

15. Increasing reactant concentrations increases reaction rates because it:

a. causes more collisions to occur between reactant particles
b. causes more intense collisions to occur between reactant particles
c. allows reactant molecules to line up better prior to colliding with one another
d. makes the reactant particles move faster prior to colliding with one another

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**PART 2: MATCHING (1 mark each = 10 marks)**

*Please match the equation on the left with the **best** type of reaction on the right. Note that the type of reaction may be used more or less than once.*

| | Equation | Type or Reaction |
|---|---|---|
| **1.** ___ | ★ + ☐ → ★☐ | **A.** synthesis |
| **2.** ___ | DC → D + C | **B.** decomposition |
| **3.** ___ | Ammonium hydroxide + copper fluoride → ammonium fluoride + copper hydroxide | **C.** single replacement |
| **4.** ___ | H■+ ☐OH → ☐■ + $H_2O$ | **D.** double replacement |
| **5.** ___ | $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$ | **E.** combustion |
| **6.** ___ | $2KClO_3 \rightarrow 2KCl + 3O_2$ | **F.** neutralization |
| **7.** ___ | XY + Z → XZ + Y | |
| **8.** ___ | PAt + BUt → BAt + PUt | |
| **9.** ___ | $CaCl_2$ + Br → $BrCl_2$ + Ca | |
| **10.** ___ | 2Mg+ $F_2$ → 2MgF | |

**PART 3: WRITTEN RESPONSE (20 marks)**

*Balance the following 10 equations by writing in the correct coefficients in the spaces provided (1 mark each). ALSO state the type of reaction each is in the right-hand column (1 mark each).*

| Reactions to Balance | Type of Reaction |
|---|---|
| **1.** ___KCl + ___$Mg(OH)_2$ → ___KOH + ___$MgCl_2$ | _____ |
| **2.** ___Cu + ___$FeCl_2$ → ___Fe + ____$CuCl_3$ | _____ |
| **3.** ___Ni + ____$I_2$ → ____$NiI_3$ | _____ |
| **4.** ___$H_2O_2$ → ___$H_2$ + ___$O_2$ | _____ |
| **5.** ___$CuBr_2$ + ___$CaSO_4$ → ___$CaBr_2$ + ___$CuSO_4$ | _____ |
| **6.** ___HF + ___KOH → ___KF + ___$H_2O$ | _____ |
| **7.** ___Na + ___$H_2SO_4$ → ___$Na_2SO_4$ + ___$H_2$ | _____ |
| **8.** ___HCl + ___$Sn(OH)_2$ → ___$SnCl_2$ + ___$H_2O$ | _____ |
| **9.** ___$MnBr_3$ → ___Mn + ___$Br_2$ | _____ |
| **10.** ___$C_4H_{10}$ + ___$O_2$ → ___$CO_2$ + ___$H_2O$ | _____ |

Answer Key

| Multiple Choice | Matching | Written | |
|---|---|---|---|
| 1. B | 1. A | 1. 2, 1, 2, 1 | Double replacement |
| 2. D | 2. B | 2. 2, 3, 3, 2 | Single replacement |
| 3. B | 3. D | 3. 2, 3, 2 | Synthesis |
| 4. D | 4. F | 4. 1, 1, 1 | Decomposition |
| 5. D | 5. E | 5. 1, 1, 1 | Double replacement |
| 6. C | 6. B | 6. 1, 1, 1, 1 | Neutralization |
| 7. A | 7. C | 7. 2, 1, 1, 1 | Single replacement |
| 8. C | 8. D | 8. 2, 1, 1, 2 | Neutralization |
| 9. C | 9. C | 9. 2, 2, 3 | Decomposition |
| 10. D | 10. A | 10. 2, 13, 8, 10 | Combustion |
| 11. B | | | |
| 12. D | | | |
| 13. C | | | |
| 14. D | | | |
| 15. A | | | |