



Science 10: Chemistry II Practice Test



NAME: _____

BLOCK: _____

Multiple Choice:

Circle the letter of the best answer. You may refer to a periodic table and an ion chart.

1. What type of reaction is the following?
silver + gold(III) nitrate \rightarrow silver nitrate + gold
A. synthesis
B. neutralization
C. single replacement
D. double replacement
2. What type of reaction is the following?
 $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$
A. single replacement
B. combustion
C. decomposition
D. double replacement
3. Classify the reaction type and predict the products of the following reaction.
 $HCl + Mg(OH)_2 \rightarrow ?$
A. double replacement; products are $MgCl$ and $H(OH)_2$
B. double replacement; products are $MgCl_2$ and H_2O
C. neutralization; products are $MgCl$ and $H(OH)_2$
D. neutralization; products are $MgCl_2$ and H_2O
4. Which of the following reactions is double replacement?
A. $Pb + 2CuCl_2 \rightarrow PbCl_2 + 2Cu$
B. $Na_2CO_3 + CaBr_2 \rightarrow CaCO_3 + 2NaBr$
C. $MgCO_3 + 2HBr \rightarrow MgBr_2 + CO_2 + H_2O$
D. $Mg(OH)_2 + 2HBr \rightarrow MgBr_2 + 2H_2O$
5. What are the products in the decomposition reaction involving aluminum oxide?
A. Al and O
B. Al_2O_3
C. Al and O_2
D. AlO
6. What is formed when HCl and NaOH solutions are combined?
A. NaCl and H_2O
B. NaH and ClOH
C. NaOCl and H_2
D. There is no reaction.

6. Which of the following household items is basic?
- baking soda
 - grapes
 - bananas
 - water
7. What are the colours of methyl red indicator and bromothymol blue indicator in separate samples of water at pH 7?
- Methyl red indicator is red, and bromothymol blue indicator is yellow.
 - Methyl red indicator is yellow, and bromothymol blue indicator is blue.
 - Methyl red indicator is yellow, and bromothymol blue indicator is green.
 - Methyl red indicator is orange, and bromothymol blue indicator is green.
8. Which are properties characteristic of an acid but not a base?
- sour, reacts with magnesium, turns litmus blue
 - bitter, reacts with magnesium, turns litmus red
 - slippery touch, does not react with magnesium, turns litmus blue
 - sour, turns phenolphthalein indicator colourless, turns litmus red
9. What the best chemical definition of a salt?
- a material found by evaporating sea water
 - a material formed by the reaction of an acid with a base
 - a material containing a metal ion and an oxide ion
 - a material containing a metal ion and carbonate ion
10. Burning magnesium in air produces a brilliant white flame and a white powder. When the white powder is placed in water, it dissolves. What is the colour when bromothymol blue indicator is added to this solution?
- colourless
 - yellow
 - green
 - blue

Match the Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.	
Term	Descriptor
_____ 11. synthesis	A. a reaction in which a compound splits into two elements
_____ 12. precipitate	B. the reaction involving a burning candle
_____ 13. combustion	C. the reaction of an acid with a base
_____ 14. surface area	D. a solid that forms when two ionic solutions are mixed
_____ 15. neutralization	E. a substance that increases reaction rate without being used up by the reaction
	F. a reaction in which two elements combine to form a compound

Match the Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.	
Term	Descriptor
_____ 11. indigo carmine	A. releases OH ⁻ ions in solution
_____ 13. base	B. releases H ⁺ ions in solution
_____ 14. acid	C. acid-base indicator
_____ 15. concentration	D. a set of numbers that measure acidity levels
_____ 16. pH scale	E. a liquid capable of dissolving other substances
	F. turns red in acid
	G. a measure of the quantity of a substance dissolved in a given volume

Short Answer Questions

17. Identify each of the following descriptions as synthesis, decomposition, single replacement, double replacement, neutralization, or combustion.
- (a) There is only one reactant. _____
- (b) One reactant is an element. The other is a compound. _____
- (c) Two ionic compounds react to form two new ionic compounds. _____
18. Which of the four factors affecting reaction rate is most important in each question below? Choose from among concentration, temperature, surface area, and catalyst.
- (a) Dust in a granary explodes when it comes in contact with a spark. _____
- (b) Table sugar is digested in the mouth when it dissolves in saliva, which contains a digestive enzyme. _____
- (c) A person blows on a fire to help get it burning better. _____
19. Complete and balance each of the following equations. Then classify each reaction type.
- (a) $\text{Zn} + \text{Cu(OH)}_2 \rightarrow$
Reaction type: _____
- (b) $\text{C}_2\text{H}_4 + \text{O}_2 \rightarrow$
Reaction type: _____
- (c) $\text{Al} + \text{S}_8 \rightarrow$
Reaction type: _____

2. Write a balanced chemical equation to represent each reaction described below.

(a) Aluminum metal reacts with oxygen to form aluminum oxide.

(b) Metallic zinc combines with sulphur to form zinc sulphide.

2. Write a balanced chemical equation to represent each reaction described below.

(a) Rubidium oxide decomposes into its elements.

(b) Calcium chloride decomposes into its elements.

2. Write a balanced chemical equation to represent each reaction described below.

(a) Silver reacts with gold(III) nitrate.

(b) Copper reacts with lead(II) sulphate.

2. Write a balanced chemical equation to represent each reaction described below.

(a) Solutions of sodium hydroxide and hydrochloric acid react.

(b) A silver nitrate solution reacts with a sodium chloride solution.

2. Write a balanced chemical equation to represent each reaction described below.

(a) Candle wax, $C_{25}H_{52}$, is burned to produce carbon dioxide and water.

(b) Sucrose $C_{12}H_{22}O_{11}$, is burned to produce carbon dioxide and water.

20. Classify each reaction as either endothermic or exothermic, and briefly explain your answer.

Description of Chemical Reaction	Endothermic or Exothermic?	Explanation
A piece of paper is ignited and burns with a bright flame.		
Pentaborane (a colourless liquid), B_5H_9 , reacts violently with oxygen gas to form solid diborane, B_2O_3 , and water, typically bursting into flame and often exploding.		
Pure iron metal is formed and carbon dioxide is released when iron(III) oxide ore is heated to a very high temperature in the presence of solid carbon.		
Sodium hydroxide solution and hydrochloric acid solution are mixed. The temperature of the mixture increases.		
Mixing ammonium thiocyanate and barium hydroxide octahydrate in a beaker causes water on the outside of the beaker to freeze.		

21. A student claims that the reaction of butane gas and oxygen gas must be endothermic since a spark is needed to ignite the butane gas in a lighter. Do you agree or disagree with this claim? Explain your answer.
