, e	Name:Period:Date:
272	Chemical Equations Practice Quiz
70/	a) PH <sub>5</sub> b) CH <sub>4</sub> c) CO <sub>2</sub> d) NH <sub>3</sub>
anto	2) Which of the following formula best describes the molecules shown in the box?  a) 3CH <sub>4</sub> b) 4CH <sub>4</sub> c) 3CO <sub>2</sub> d) 4NH <sub>3</sub>
for Pictures @ front of class	3) Which of the following formula best describes the molecules shown in the box?  a) 5CH <sub>4</sub> c) 3CH <sub>4</sub> + 2CO <sub>2</sub> b) 2CH <sub>4</sub> + 3O <sub>2</sub> d) 2CH <sub>4</sub> + 3CO <sub>2</sub>
24/20	4) How many molecules are on the REACTANT side? a) 7 b) 5 c) 3 d) 2
Pig	5) Is the above reaction BALANCED? a) Yes b) No
88	6) Which of the following is the most likely chemical equation that describes the above reaction?  a) N <sub>2</sub> O <sub>5</sub> + NO → 3NO <sub>2</sub> b) Mg + 2H <sub>2</sub> O → Mg(OH) <sub>2</sub> + H <sub>2</sub> -  c) 2H <sub>2</sub> + O <sub>2</sub> → 2H <sub>2</sub> O  d) 2Al + Fe <sub>2</sub> O <sub>3</sub> → 2Fe + Al <sub>2</sub> O <sub>3</sub>
	7) If the reactant side is written as $5O_2 + 2CH_2$ , then how should the product side be written?
	a) $2O_2 + 5CH_2$ b) $5O_2 + 2CH_2$ c) $H_2O + 4CO_2$ d) $4H_2O + CO_2$ 5 $O_2 + 2CH_2$ 7 $H_2O + 4(O_2)$
	a) Yes  5) No
	9) What is missing from the reactant side?  a) 2O <sub>2</sub> c) H <sub>2</sub> O b) 2CH <sub>2</sub> d) CO <sub>2</sub>
	10) What are the missing coefficients in the following equation? (Show your work)
	$4_{\text{NH}_3} + 5_{\text{O}_2} \rightarrow 4_{\text{NO}} + 6_{\text{H}_2\text{O}}$

a) 1, 2, 1, 3 b) 0, 2, 1, 3 c) 4, 5, 4, 6 d) 4, 6, 4, 6

Name:	Period:	_Date:

#### Practice Quiz: Chemical Reactions

Multiple Choice: Write the letter representing the best answer in the blank space in front of each question.

Use the equation below to answer questions 1 - 5.

 $2Al + 3H_2SO_4 \rightarrow Al(SO_4)_3 + 3H_2$ 

1) Which molecule(s) are on the product side?

- a. Al and H<sub>2</sub>SO<sub>4</sub>
- c. Al, S, O, and H.
- b. Al(SO<sub>4</sub>)<sub>3</sub> and H<sub>2</sub>
- d. The right side

2) Which molecule(s) are on the reactant side?

- a. Al and H<sub>2</sub>SO<sub>4</sub>
- c. Al, S, O, and H.
- b.  $Al(SO_4)_3$  and  $H_2$
- d. The left side

) What does the '+' symbol mean?

a. 'and'

- c. 'forms bonds with'
- b. 'turns into'
- d. 'plus'

4) How many oxygen atoms are on the product side?

a. 12

c. 4

b. 7

d. 3

5) How many molecules of aluminum sulfate are on the reactant side?

a. 3

c. 1

b. 2

.d. 0

6) Which of the following ions is NOT a cation?

- a. Calcium ion
- c. Iron (III) ion
- b. Barium ion
- d. Sulfide ion

7) Which of the following ions is NOT an anion?

- a. Oxide ion
- c. Carbonate ion

b. Lead ion

d. Carbide ion

8) Which of the following is a monoatomic ion?

- a. (1)
- c. NH4<sup>+</sup>

b. ClO

d. PO43-

1			
19) V	Vhich of the following is the co	rrect formula for <u>barium citrate?</u>	Bat 2t
	a. BaC <sub>6</sub> H <sub>5</sub> O <sub>7</sub>	c. Ba(C <sub>6</sub> H <sub>5</sub> O <sub>7</sub> ) <sub>2</sub>	C. H=0
	b. Ba <sub>2</sub> C <sub>6</sub> H <sub>5</sub> O <sub>7</sub>	d. Ba <sub>3</sub> (C <sub>6</sub> H <sub>5</sub> O <sub>7</sub> ) <sub>2</sub>	C. H5-0-
$\wedge$			
20) V	Which type of reaction breaks b	pigger molecules into smaller molecu	las2
	a. Decomposition	c. Combustion	(63)
^	b. Single displacement	d. Synthesis	
		•	
21) W	hich type of reaction requires	O₂ as a reactant?	
·	a. Decomposition	c. Combustion	
	b. Single displacement	d. Synthesis	
B			
12 22) W	which type of reaction replaces	the cation in an ionic compound?	
	a. Decomposition	c. Combustion	
	b. Single displacement	d. Synthesis	
33/ 14	/high:type of magatical at a star	1 111	
form a large	rnich Type of reaction starts ou er molecule?	t with smaller molecules and combin	nes them to
orm a large	a. Decomposition	a Caral all	
•	b. Single displacement	c. Combustion	
$\wedge$	o. ongre dispracement	d. Synthesis	
H 24) W	hich type of reaction is shown	by the equation below?	
	The stream is shown	by the education below:	
	CH3OH> CO + 2H2		
	3		
	a. Decomposition	c. Combustion	
	b. Single displacement	d. Synthesis	
	3	G. 5711116515	
25) W	hich type of reaction is shown b	by the equation below?	
	·		
	6CO <sub>3</sub> + 6 H <sub>2</sub> O> C <sub>6</sub> H <sub>12</sub>	06 + 602	
	a. Decomposition	c. Combustion	
	b. Single displacement	d. Synthesis	
	,	,	
26) Wh	nich type of reaction is shown b	y the equation below?	
	2PbNO3 + CaSO4> Pb2SO4 +	+ Ca(NO3)2	
	·	- <del>-</del>	
\ (	1. Decomposition	c. Combustion	
	Single displacement	d. Synthesis	
	Double Disdage		
7	work nispiace	21000	

Use	the	following	symbol	to	answer	questions	27	through	30
		10110111119	0 / 11 10 OL	10	UIIDIYEI	4463110113	~ 1	THE OUGH	JU.

3(NH <sub>4</sub> )	) <sub>2</sub> CrO <sub>4</sub>
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C

27) How many atoms of hydrogen (H) are present?

a. 4

c. 16

b. 8

d. 24

28) How many atoms of chromium (Cr) are present?

a. 1

c. 3

b. 2

d. 4



29) How many atoms of nitrogen (N) are present?

a. 1

c. 3

b. 2

d. 6



30) How many molecules of ammonium ( $NH_4$ ) are present?

a. 1

c. 3

b. 2

d. 6



31) What are the missing coefficients in the following equation?

- a. 0, 2, 2, 3
- c. 0, 3, 2, 3
- b. 1, 2, 2, 3
- d. 1, 3, 2, 3



32) What are the missing coefficients in the following equation?

- a. 2, 4, 3, 4
- c. 1, 6, 3, 4
- b. 0, 5, 3, 4
- d. 1, 5, 3, 4



• • •

33) What are the missing coefficients in the following equation?

$$P_4 + 50_2 - 2P_20_5$$

- a. 1, 5, 2
- c. 1, 6, 3
- b. 0, 5, 2
- d. 1, 5, 3

# word equation s

-restate the following equations as needed.

Hydrogen gas reacts with oxygen gas to make liguid water.

ANOSCO + KCO) A K2PCS) + Me CO)
Solid Potassila Ridrate creactionity solid

- 3) Solid Magnesium metal reacts with liquid water to form solid magnesium hydroxide and hydrogen gas.

  Mg(s) +2H2D(a) -> Mg(OH)2(s) + H2(g)
- 4) Aqueous Sodium hydroxide reacts with aqueous nitric acid (HNO3) to yield aqueous sodium nitrate and liquid water.
  NaOH (ag) + HNO3(ag) -> NaNO3(ag) + H2O(a)

CL/	<b>ASSI</b>	FICA	TIO	N O	F
CH	EMIC	CAL	REA	CTI	ONŞ

Name \_\_\_\_\_

Classify the reactions below as synthesis, decomposition, single replacement (eationic or enterte) or double restreament. Exchange

1. 
$$2H_2 + O_2 \rightarrow 2H_2O$$

combination

2. 
$$2H_2O \rightarrow 2H_2 + O_2$$

decomposition

3. 
$$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$$

single exchange

4. 
$$2CO + O_2 \rightarrow 2CO_2$$

combination

5. 
$$2HgO \rightarrow 2Hg + O_2$$

decorposition

6. 
$$2KBr + Cl_2 \rightarrow 2KCl + Br_2$$

Single exchange

7. CaO + 
$$H_2O \rightarrow Ca(OH)_2$$

combination

8. 
$$AgNO_3 + NaCl \rightarrow AgCl + NaNO_3$$

double exchange

9. 
$$2H_2O_2 \rightarrow 2H_2O + O_2$$

combination

10. 
$$Ca(OH)_2 + H_2SO_4 \rightarrow CaSO_4 + 2H_2O$$

double exchange

BALANCING CHEMICAL EQUATIONS Name
Rewrite and balance the equations below.  1. $N_2 + H_2 \rightarrow NH_3 \qquad N_2 + 3H_2 \rightarrow 2NH_3$
2. KCIO <sub>3</sub> → KCI + O <sub>2</sub> 2 KClO <sub>3</sub> → 2 KCl + 3 O <sub>2</sub>
3. NaCi + F <sub>2</sub> → NaF + Ci <sub>2</sub> 2 NaCl + F <sub>2</sub> → ZNaF + Cl <sub>2</sub>
4. H <sub>2</sub> + O <sub>2</sub> → H <sub>2</sub> O 2 H <sub>2</sub> + O <sub>2</sub> → 2 H <sub>2</sub> O
5. AgNO3 + MgCl2 → AgCl + Mg(NO3)2 2AgNO3 + MgCl2 → 2AgCl + Mg(NO3)2
6. AlBr <sub>3</sub> + K <sub>2</sub> SO <sub>4</sub> → KBr + Al <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> 2A Br <sub>3</sub> + 3K <sub>2</sub> SO <sub>4</sub> → bKBr + Al <sub>2</sub> (SO <sub>4</sub> )
7. CH <sub>4</sub> + O <sub>2</sub> → CO <sub>2</sub> + H <sub>2</sub> O CH4 + 2O <sub>2</sub> → CO <sub>2</sub> + 2H <sub>2</sub> O
8. C <sub>3</sub> H <sub>8</sub> + O <sub>2</sub> → CO <sub>2</sub> + H <sub>2</sub> O C <sub>3</sub> H <sub>8</sub> + 5O <sub>2</sub> → 3CO <sub>2</sub> + 4H <sub>2</sub> O
9. $C_8H_{18} + O_2 \rightarrow O_2 + H_2O 2C_8H_{18} + 25O_2 - > 16CO_2 + 18H_2O$
10. FeCl <sub>3</sub> + NaOH → Fe(OH) <sub>3</sub> + NaCI FeCl <sub>3</sub> + 3 NaOH → Fe(OH) <sub>3</sub> +3 NaCl
11. $P + O_2 \rightarrow P_2O_5 \qquad 4P + 5O_2 \rightarrow 2 P_2O_5$
12. Na + H20 -> NaOH + H2 2 Na + 2 H20 -> 2 NaOH + H2
13. Ag <sub>2</sub> O → Ag + O <sub>2</sub> 2Ag <sub>2</sub> O → 4Ag + O <sub>2</sub>
14. $S_8 + O_2 \rightarrow SO_3 \qquad S_8 + 12O_2 \rightarrow 8SO_7$
15. CO2 + H2O → C6H12O6 + O2 6 CO2 + 6H2O → C6H12O6+602
16. K + MgBr <sub>2</sub> → KBr + Mg 2K + Mg Br <sub>2</sub> → 2KBr + Mg

17. HCI + CaCO3 → CaCl2 + H2O + CO2 2HCl + CaCO3 → CaCl2+H2O+(O2



#### **Key Terms**

physical change coefficient formula unit combination reaction decomposition reaction single exchange reaction (single replacement) double exchange reaction (double replacement)

#### SUMMARY

## Toxic Changes

### **Toxins Update**

A toxic substance causes an undesirable chemical reaction, producing a harmful or unhealthy change in a living system. Chemical equations keep track of these changes and allow you to predict what you will observe when compounds combine. Becoming familiar with chemical equations is the first step in understanding these chemical changes.

#### **Review Exercises**

- 1. Why is it difficult to identify a physical or chemical change through observations alone? You can't always see a chem. chry
- 2. Based on the chemical equation for a reaction, can you tell if any of the substances are toxic? yes
- 3. Consider the equation for the formation of a kidney stone.

$$Na_3PO_4(aq) + 3Ca_2Cl_2(aq) \longrightarrow Ca_3(PO_4)_2(s) + 6NaCl(aq)$$

- a. Is each reactant bonded ionically or covalently? How do you know?
- **b.** Is this is a combination reaction, decomposition reaction, single exchange reaction, of double exchange eaction?
- c. Is this chemical change or a physical change?
- d. How does a balanced reaction show that matter is conserved?
- e. What is the chemical name of the solid that makes up a kidney stone?

  4. Copy and balance these chemical equations.

a. 
$$N_2(g) + 2H_2(g) \longrightarrow N_2H_4(g)$$
  
b.  $N_2(g) + N_2(g) \longrightarrow N_2H_4(g)$   
c.  $H_2SO_4(aq) + NaCN(aq) \longrightarrow 2HCN(g) + Na_2SO_4(aq)$ 

c. 
$$H_2SO_4(aq) + NaCN(aq) \longrightarrow 2HCN(g) + Na_2SO_4(aq)$$

d. 
$$2H_3PO_4(aq) + 3Ca(OH)_2(aq) \longrightarrow Ca_3(PO_4)_2(aq) + 6H_2O(l)$$
  
e.  $C_3H_8(g) + 5O_2(g) \longrightarrow CO_2(g) + 1H_2O(l)$ 

e. 
$$C_3H_8(g) + 5O_2(g) \longrightarrow 3CO_2(g) + 1H_2O(l)$$

**f.** 
$$2H_2S(g) + 3O_2(g) \longrightarrow 2SO_2(g) + 2H_2O(l)$$

$$g.2H_2(g) + O_2(g) - 2H_2O(l)$$



Toxins in the Environment

Research a potentially toxic substance. (Your teacher may assign you one.) Find out where in your environment you might find this substance and describe its effects on the body. Prepare a short report.