Name KEY 2011

Period_____

The **Law of Conservation of Mass** states that the mass of all substances before a reaction equals the mass of all substances after a reaction. In other words, the total atomic mass of the reactants should equal the total atomic mass of the products---if the equation is balanced properly. Add the states to each element or compound.

Example $Mg + O_2 \rightarrow MgO$
Balanced $2Mg + O_2 \rightarrow 2MgO$
Atomic Mass $2(24) + 2(16) \rightarrow 2(24+16)$
$48 + 32 \rightarrow 48 + 38$
$80 \rightarrow 80$

Part I: Balance the following equations and using the periodic table, calculate atomic masses of the reactants and products.

1. $2FeO \rightarrow Fe + O_2$

$2(55.8) + 2(16) \rightarrow 2(55.8) + 2(16)$
2Fe O Fe O_2
$143.6 \rightarrow 143.6$

2. $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

$65.4 + 2 + 2(35.5) \rightarrow 65.4 + 2(35.5) + 2$
Zn H Cl Zn Cl H
$138.4 \rightarrow 138.4$

3. $NaOH + HCl \rightarrow H_2O + NaCl$ Balanced

$(23+16+1) + (1+35.5) \rightarrow (2+16) + (23+35.5)$
NaOH HCl H_2O NaCl
$76.5 \rightarrow 76.5$

Part II: Using the word equation, write and balance the following:

1. calcium oxide + water → calcium hydroxide

$CaO_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)}$

2. silver nitrate + nickel → nickel (II) nitrate + silver

$2AgNO_{3(aq)} + Ni_{(s)} \rightarrow Ni(NO_3)_{2(aq)} + 2Ag_{(s)}$

3. sodium hydroxide + hydrochloric acid → sodium chloride + water

$NaOH_{(aq)} + HCl_{(l)} \rightarrow NaCl_{(s)} + H_2O_{(l)}$

4. zinc + sulfur → zinc sulfide

$Zn_{(s)} + S_{(s)} \rightarrow ZnS_{(s)}$

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BALANCING EQUATIONS PRACTICE

Balance the following equations and include the states (use *s* for metals, *aq* for salts, acids, bases and *g* for gases with parentheses).

1) 1 $BaCl_2$ + 1 K_2SO_4 → 1 $BaSo_4$ + 2 KCl

2) 1 $CuSO_4$ + 2 NaOH → 1 $Cu(OH)_2$ + 1 Na_2SO_4

3) 4 Al + 3 O_2 → 2 Al_2O_3

4) 2 Ca + 1 O_2 → 2 CaO

5) 1 Cu + 2 $AgNO_3$ → 2 Ag + 1 $Cu(NO_3)_2$

6) 1 Zn + 2 $AgNO_3$ → 2 Ag + 1 $Zn(NO_3)_2$

7) 1 $MgBr_2$ + 1 Cl_2 → 1 $MgCl_2$ + 1 Br_2

8) 1 Zn + 2 HCl → 1 $ZnCl_2$ + 1 H_2

9) 1 NaOH + 1 HCl → 1 NaCl + 1 H_2O

10) 2 $AgNO_3$ + 1 Ni → 1 $Ni(NO_3)_2$ + 2 Ag

11) 1 Zn + 1 S → 1 ZnS

12) 1 CaO + 1 H_2O → 1 $Ca(OH)_2$