Name: KEY

Ch. 11 Study Guide

Know these things:

- ✓ Know and be able to recognize the 5 types of chemical reactions
- ✓ How to read chemical equations including the different symbols
- ✓ How to balance chemical equations using coefficients
- ✓ How to count the number of atoms in a compound
- ✓ The difference between reactants and products
- ✓ Understand, recognize, and be able to write word equations, skeleton equations, and balanced equations
- ✓ What a catalyst is and does, and how to represent it in an equation
- ✓ What the activity series is and how to use it
- ✓ The difference between coefficients and subscripts
- ✓ What elements exists as diatomic when found by themselves

Here are some practice problems:

*Balance the reactions **1 to 6** and indicate which type of chemical reaction (synthesis, decomposition, single-displacement, double-displacement or combustion) is being represented:*

1. 2 NaBr + ____ $Ca(OH)_2$ → ___ $CaBr_2$ + 2 NaOH Reaction Type : double

2. 2 NH_3 + ____ H_2SO_4 → ____ $(NH_4)_2SO_4$ Reaction Type : Combination

Can Solve!

3. 4 C_5H_9O + 27 O_2 → 20 CO_2 + 18 H_2O Reaction Type : Combustion

4. 3 Pb + 2 H_3PO_4 → 3 H_2 + ____ $Pb_3(PO_4)_2$ Reaction Type : Single

5. ____ Li_3N + 3 $NH_4(NO_3)$ → 3 $Li(NO_3)$ + ___ $(NH_4)_3N$ Reaction Type : double

6. 3 HBr + ___ $Al(OH)_3$ → 3 H_2O + ___ $AlBr_3$ Reaction Type : double

Indicate which type of chemical reaction (synthesis, decomposition, single-displacement, double-displacement or combustion) is being represented in 7 to 15.

7. $Na_3PO_4 + 3\ KOH \rightarrow 3\ NaOH + K_3PO_4$ Reaction Type double

8. $MgCl_2 + Li_2CO_3 \rightarrow MgCO_3 + 2\ LiCl$ Reaction Type double

9. $C_6H_{12} + 9\ O_2 \rightarrow 6\ CO_2 + 6\ H_2O$ Reaction Type Combustion

10. $Pb + FeSO_4 \rightarrow PbSO_4 + Fe$ Reaction Type single

11. $CaCO_3 \rightarrow CaO + CO_2$ Reaction Type decomposition

12. $P_4 + 3\ O_2 \rightarrow 2\ P_2O_3$ Reaction Type Synthesis

13. $2\ RbNO_3 + BeF_2 \rightarrow Be(NO_3)_2 + 2\ RbF$ Reaction Type double

14. $2\ AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2\ Ag$ Reaction Type single

15. $C_3H_6O + 4\ O_2 \rightarrow 3\ CO_2 + 3\ H_2O$ Reaction Type Combustion

Answer the following with either a symbol or a meaning.

(aq) → aqueous, dissolved in H_2O

Heat is added to the reaction → Δ

Solid, liquid, gas → (s), (l), (g)

\+ → separates products or reactants

$\leftrightarrow$ → reaction is reversible

Catalyst is used → $\xrightarrow{MnO_2}$

Yield, produces, etc → $\longrightarrow$

On the next page, determine how many atoms are in the compounds.

Directions for each problem

1) write down the different elements in each compound.

2) write down how many of that particular atom there are

3) how many atoms are there total in the compound.

1) 4 HNO_3

H - 4
N - 4
O - 12
20

2) 4 $Mg(OH)_2$

Mg - 4
O - 8
H - 8
20

3) 5 $ZnSO_4$

Zn - 5
S - 5
O - 20
30

4) 2 $Sr_3(PO_4)_2$

Sr - 6
P - 4
O - 16
26

5) 4 $Al(OH)_3$

Al - 4
O - 12
H - 12
28

6) $Ca(C_2H_3O_2)_2$

Ca - 1
C - 4
H - 6
O - 4
15

7) 4 $Al_2(SO_3)_3$

Al - 8
S - 12
O - 36
56

8) 2 $(NH_4)_3PO_4$

N - 6
H - 24
P - 2
O - 8
40

9) 4 $Mg(OH)_2$

Mg - 4
O - 8
H - 8
20

- same as #2

Activity Series of Metals (decreasing)

Name	Symbol
Lithium	Li
Calcium	Ca
Sodium	Na
Magnesium	Mg
Aluminum	Al
Zinc	Zn
Iron	Fe
Lead	Pb
Copper	Cu
Mercury	Hg
Silver	Ag

Complete the following word equations by performing a single-replacement reaction and writing the skeleton equation. Some may have no reaction at all, in which you should indicate that as well – use the activity series. Then, write the final, balanced equation for each.

1. Copper (II) sulfide + Magnesium →
   Skeleton equation: $CuS + Mg \rightarrow MgS + Cu$
   Balanced equation: balanced already

+2

2. Mercury + Silver (I) chloride →
   Skeleton equation: $Hg + AgCl \rightarrow HgCl_2 + Ag$
   Balanced equation: $Hg + 2AgCl \rightarrow HgCl_2 + 2Ag$
3. Bromine + Cesium chloride →
   Skeleton equation: $Br + CsCl \rightarrow$ will not react
   Balanced equation: N/A

(Br is less reactive than Cl - see me if you don't understand)

4. Sodium bromide + Fluorine →
   Skeleton equation: $NaBr + F_2 \rightarrow NaF + Br_2$
   Balanced equation: $2NaBr + F_2 \rightarrow 2NaF + Br_2$