Writing Basic Chemical Equations

1. List (4) possible signals that a chemical reaction has occurred? Are these clues always visible? Can you think of any other indications that a chemical reaction has occurred?

2. A solution of hydrogen peroxide, H_2O_2 , is often used to clean cuts and scrapes, particularly if it is feared that anaerobic bacteria such as Clostridium (the microbe that causes tetanus) have been introduced into the wound. What evidence is there for a chemical reaction taking place when hydrogen peroxide is applied to a wound?

3. Sterling silver, as used for fashioning jewelry and dinnerware, tarnishes easily when exposed to air. Is there evidence that products for removing tarnish from silver work by chemical reaction?

Directions: Fill in the blanks with the appropriate term(s).

4. The substances present before a chemical reaction takes place are called the ______, and the substances present after the reaction takes place are called the ______.

5. In a chemical reaction, ______ are neither created nor destroyed.

6. What do the following notations after a substances chemical formula indicate?

(g)	(I)
(s)	(aq)

b) Write the diatomic seven.



Directions: Write balanced chemical equations for the processes described in each of the following problems. In some cases you will need to write a chemical formula from the name of the compound.

7. When a mixture of powdered gray zinc metal and powdered yellow sulfur is heated strongly, a spectacular chemical reaction occurs, and white zinc sulfide solid is produced. Write the unbalanced chemical equation for this process.

8. Solid ammonium carbonate, $(NH_4)_2CO_3$, is used as the active ingredient in "smelling salts". When solid ammonium carbonate is heated, it decomposes into ammonia (NH_3) gas and carbon dioxide gas. Write the balanced chemical equation for this process.

9. If elemental chlorine gas is bubbled through a solution of potassium iodide, the iodide ion is converted to elemental iodine, which may be recovered as a gray solid, leaving a solution of potassium chloride. Write the balanced chemical equation for this process.

10. Calcium metal is moderately reactive. If turnings of calcium are added to water, the metal begins to bubble as hydrogen gas is formed. The water begins to turn cloudy, as relatively insoluble (solid) calcium hydroxide begins to form. Write the balanced chemical equation for this process.

11. Hydrogen sulfide gas is responsible for the odor of rotten eggs. Hydrogen sulfide burns in air, producing sulfur dioxide gas and water vapor. Write the balanced chemical equation for this process.

Directions: Convert the chemical reactions into word sentences. Don't forget to to include phases and use words such as combines, decomposes and creates (to make) and to state how many moles are involved in the reaction.

For example: $H_2(g) + Cl_2(g) \rightarrow 2HCl(g)$

Answer: 1 mole of Hydrogen gas combines with 1 mole of chlorine gas to produce 2 moles of gaseous hydrogen chloride (hydrochloric acid).

12. 2NO(g) + O₂(g) \rightarrow 2NO₂(g)

13. TiCl₄(I) + 4Na(s) \rightarrow 4NaCl(s) + Ti(s)

14. $Br_2(I) + 2KI(aq) \rightarrow 2KBr(aq) + I_2(s)$

15. $4Co(s) + 3O_2(g) \rightarrow 2Co_2O_3(s)$

16. $2\text{KClO}_3(s) \rightarrow 2\text{KCl}(s) + 3\text{O}_2(g)$

17. $4Cr(S) + 3O_2(g) \rightarrow 2Cr_2O_3(S)$

18. $2C_2H_6(g)$ + 70₂(g) → $4CO_2(g)$ + $6H_2O(g)$

 $(C_2H_6$ is called ethane)