

## The Equation Lab --- PART ONE DAY ONE

Procedure: Perform the steps as instructed and then write balanced equations.

1. Light a Bunsen burner. Using tongs, place a small piece of steel wool in the flame.

There are two reactions. Methane is  $\text{CH}_4$ . Assume formation of  $\text{Fe}^{+++}$

iron + oxygen ( $\text{O}_2$ )  $\rightarrow$  Iron (III) oxide

methane ( $\text{CH}_4$ ) + oxygen ( $\text{O}_2$ )  $\rightarrow$  carbon (IV) oxide + water

*(carbon (IV) oxide is more often called carbon dioxide)*

2. Use tongs to hold a piece of Mg in a Bunsen burner flame. DO NOT STARE DIRECTLY AT THE FLAME!!!

Magnesium + oxygen  $\rightarrow$  Magnesium oxide

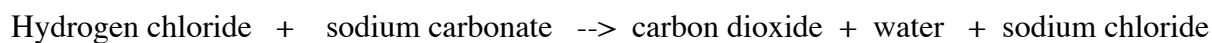
3. Use tongs to hold a piece of Cu in a Bunsen burner flame. (Assume that a copper (II) compound forms).

. Copper + oxygen ( $\text{O}_2$ )  $\rightarrow$  copper (II) oxide

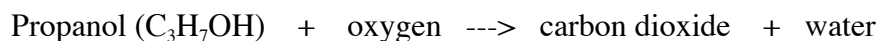
4. In a test tube, add about .5 g of manganese dioxide to about 5 - 10 ml of hydrogen peroxide. Test the gas with a glowing splint.  $\text{MnO}_2$  plays the role of a catalyst and should be written above the arrow in this equation.



5. In a test tube, mix 2 - 3 drops of HCl with about .5 grams of sodium carbonate.



6. Put 5 ml of 2 propanol in an evaporating dish. **PUT THE LID BACK ON THE BOTTLE. CAREFULLY** light the liquid with a burning splint. (You don't have to write the splint reaction) **CAUTION--- THE DISH WILL BE HOT!!!**



## Equation Lab----part two

7. Add a few pieces of Zn to about five ml of hydrochloric acid. Light a wooden splint and hold it over the mouth of the test tube. (there are three reactions in number 7). Assume that wood is cellulose,  $(C_6H_{10}O_5)_n$ .

Reaction one:           Zinc   + Hydrogen Chloride ----> Zinc chloride   + hydrogen

Reaction two:           cellulose  $(C_6H_{10}O_5)$  + oxygen  $(O_2)$  ---> carbon dioxide + water

Reaction three:       hydrogen + oxygen  $(O_2)$  ---> water

8. Put 1-2 drops of aqueous lead (II) nitrate on a piece of transparency film with 1-2 drops of aqueous potassium iodide. **When finished, put the film in the trash.**

Lead (II) nitrate + potassium iodide --> lead (II) iodide + potassium nitrate

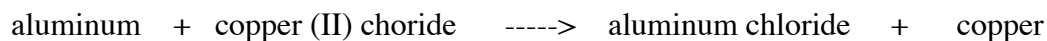
9. Place about 25 grams of *sodium hydrogen carbonate* (baking soda) in a CLEAN, DRY 125 mL flask. Place a watch glass over the opening of the flask. Using a ring stand, ring clamp, wire gauze, and Bunsen burner, heat the baking soda. Place an ice cube on the watch glass and then observe the watch glass closely for a minute or two. Now remove the watch glass a hot hand and place a burning splint into the flask and observe. Remove the flask from the ring stand set-up using a hot hand. Gently shake the flask and observe what happens. Set the hot flask in the cooling pan. **CLEAN OUT THE FLASK!!**

sodium hydrogen carbonate -----> sodium oxide + carbon dioxide + water

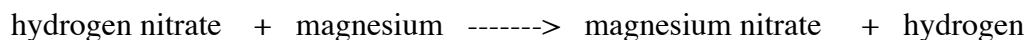
**10.** Put about 75 ml of hydrogen oxide in a 125 ml or 250 ml flask. Add about 5 drops of bromothymol blue indicator. Use a straw to blow bubbles in the flask until something changes. (The bromothymol blue is an indicator that is yellow at an acidic pH. It is not involved in the reaction between carbon dioxide and hydrogen oxide).



**11.** Place an *aluminum* pellet in a test tube. Add enough *copper (II) chloride* to cover the aluminum. Wait several minutes and observe. Decant the solution into the sink. Discard extra aluminum into a garbage can.



**12.** Add about 3 ml of nitric acid to a test tube. Add a small piece of magnesium to the tube and observe. After the reaction is complete, pour the contents into the sink.



**13.** Place about 10 drops of phosphoric acid (aq) into about the same volume of aqueous sodium carbonate.

