

Name: \_\_\_\_\_

### In Class Practice Chemistry Test: Chemical Equations

1. Write the correct answer in the space to the left. (12 pts.)
- \_\_\_\_\_ Write the formulas of the *reactants* for the equation:  $\text{Fe}_2\text{O}_{3(s)} + 2\text{Al}_{(s)} \rightarrow \text{Al}_2\text{O}_{3(s)} + 2\text{Fe}_{(l)}$
  - \_\_\_\_\_ When 3.00g of  $\text{MgCl}_2$  decomposes 2.24g of  $\text{Cl}_2$  gas is produced. How many grams of Mg is also formed?
  - \_\_\_\_\_  $\text{CuCl}_{2(aq)} + \text{Na}_2\text{SO}_{4(aq)} \rightarrow 2\text{NaCl}_{(aq)} + \text{CuSO}_{4(s)}$ . Is copper(II) chloride soluble or insoluble in  $\text{H}_2\text{O}$ ?
  - \_\_\_\_\_ How many electrons would each sodium atom lose when reacting with oxygen?
  - \_\_\_\_\_ What charge will each Ca atom have when undergoing an oxidation-reduction reaction?
  - \_\_\_\_\_ When calcium reacts with chlorine it is (oxidized /reduced)?
  - \_\_\_\_\_ Acids contain the element \_\_\_\_.
  - \_\_\_\_\_ Bases produce the \_\_\_\_ ion in aqueous solution.
  - \_\_\_\_\_ In a neutralization reaction, salt and \_\_\_\_ are produced.
  - \_\_\_\_\_ How many electrons are gained by each (Br), bromine atom when it reacts with powdered Al?
  - \_\_\_\_\_ Reaction type in which a compound reacts with elemental oxygen and releases a large amount of heat.
  - \_\_\_\_\_ Evidence that a double displacement reaction took place is the formation of  $\text{H}_2\text{O}$  or a(n) \_\_\_\_.

2. Draw a structural diagram in the box that illustrates "3  $\text{Cl}_2$ " and "4 Fe". (4 pts.)



3. Write a balanced chemical equation from the description. (15 pts.)
- The Hall process is an important method by which pure aluminum is prepared. Aluminum oxide is reacted with graphite (carbon) to produce the pure metal and carbon dioxide gas is given off.
  - Sodium metal is dropped into a beaker with 50.0ml of water. Hydrogen gas and sodium hydroxide are produced.
  - Crude gunpowder contains a mixture of potassium nitrate and charcoal (carbon). When the mixture is heated a residue of potassium carbonate is produced. The explosive force comes from the force of the two gases that are also produced, carbon monoxide and nitrogen.
  - Hydrogen sulfide burns in air to produce sulfur dioxide gas and water vapor.
  - Pure elemental silicon manufactured for computer chips is produced by the reaction of sand (silicon dioxide) with elemental carbon at high temperatures. Carbon monoxide gas is also produced in this reaction.
4. Classify the following reactions as either synthesis, decomposition, single displacement, double displacement, or combustion. (5 pts.)
- \_\_\_\_\_  $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
  - \_\_\_\_\_  $2\text{KI} \rightarrow 2\text{K} + \text{I}_2$
  - \_\_\_\_\_  $2\text{C}_2\text{H}_6 + 7\text{O}_2 \rightarrow 4\text{CO}_2 + 6\text{H}_2\text{O}$
  - \_\_\_\_\_  $\text{HNO}_3 + \text{NaOH} \rightarrow \text{NaNO}_3 + \text{H}_2\text{O}$
  - \_\_\_\_\_  $2\text{K} + 2\text{H}_2\text{O} \rightarrow 2\text{KOH} + \text{H}_2$

5. Predict the products and write a complete balanced equation. (30 pts.)
- Butane,  $C_4H_{10}$ , is combusted in the air.
  - An electric current is passed through an aqueous solution of potassium iodide.
  - Barium chloride and sodium sulfate.
  - Magnesium is oxidized when burned in the air.
  - Aqueous iron(III) nitrate is mixed with aqueous potassium hydroxide
  - Mossy zinc metal is added to hydrochloric acid
  - Nitric acid is neutralized by adding the base calcium hydroxide
  - 2 liters of hydrogen gas is combined with oxygen gas.
  - Vinegar (dilute acetic acid) is reacted with sodium bicarbonate to produce a cold, fizzy reaction
  - Copper(II) chloride is reacted with silver nitrate
6. Using your solubility rules, write a balanced equation with *phase notation* for each set of soluble reactants. (12 pts.)
- Sodium phosphate and tin(II) chloride
  - Potassium hydroxide and iron(III) nitrate
  - Barium chloride and sodium hydroxide