

**Problem:** Which metals replace each other in single-replacement reactions?

**Materials (per group):**

- Four small pieces of the following metals: Cu, Mg, Fe, Zn
- Dilute solutions of the following compounds: Hydrochloric acid, copper (II) chloride, magnesium chloride, iron (III) chloride, and zinc (II) chloride
- 4 test tubes

*During this lab, solid metal was placed in a test tube and reacted with aqueous solutions of different chemicals. Using your reactivity series of metals as a reference, decide if a reaction will occur.*

**Analysis and Questions (use a separate sheet of paper to answer):**

- 1) For each reaction, write out the **balanced** chemical equation. If there was no reaction, write the reactants followed by the yields arrow and NR (no balancing necessary).

For example:

A reaction that *occurs* is:  $\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$ , while a reaction that *does not occur* is:  $\text{Cu} + \text{HCl} \rightarrow \text{NR}$

**Cu + HCl**

**Mg + HCl**

**Fe + HCl**

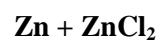
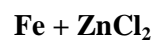
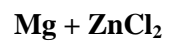
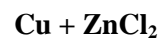
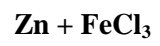
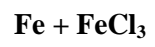
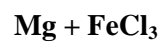
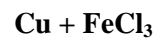
**Zn + HCl**

**Cu + CuCl<sub>2</sub>**

**Mg + CuCl<sub>2</sub>**

**Fe + CuCl<sub>2</sub>**

**Zn + CuCl<sub>2</sub>**



2) Which of the metals reacted with the most compounds?

3) Which metal reacted with the fewest compounds?

4) List the metals you reacted from most reactive to least reactive?