## **Chemical Reactions (Part 2) Worksheet**

A compound is *soluble* in a particular liquid if it dissolves in that liquid.

A compound is *insoluble* if it does not dissolve in the liquid.

An *aqueous* solution is a homogeneous mixture of a substance with water.

1. Is each compound soluble or insoluble?

AgBr

CaCl<sub>2</sub>

 $Pb(NO_3)_2$ 

PbSO<sub>4</sub>

2. Write an equation for the precipitation reaction that occurs (if any) when solutions of sodium carbonate and copper (II) chloride are mixed.

3. Write an equation for the precipitation reaction that occurs (if any) when solutions of lithium nitrate and sodium sulfate are mixed.

4. Which chemical equation is a net ionic equation?

$$K_2SO_4(aq) + BaCl_2(aq) \rightarrow BaSO_4(s) + 2 KCl(aq)$$

$$2 K^{+}(aq) + SO_4^{2-}(aq) + Ba^{2+}(aq) + 2Cl^{-} \rightarrow BaSO_4(s) + 2 K^{+}(aq) + 2Cl^{-}(aq)$$

$$Ba^{2+}(aq) + SO_4^{2-}(aq) \rightarrow BaSO_4(s)$$

- 6. What are the clues that a chemical reaction has occured?
  - 1)
  - 2)
  - 3)
  - 4)
  - 5)

8. List the different types of reactions and properties of each.

6. Which of these are redox reactions?

$$2 \text{ Mg}(s) + O_2(g) \rightarrow 2 \text{ MgO}(s)$$

$$2~\mathrm{HBr}(aq) + \mathrm{Ca}(\mathrm{OH})_2(aq) \rightarrow 2~\mathrm{H_2O}(l) + \mathrm{CaBr}_2(aq)$$

$$Ca(s) + Cl_2(g) \rightarrow CaCl_2(s)$$

$$\operatorname{Zn}(s) + \operatorname{Fe}^{2+}(aq) + \operatorname{Zn}^{2+}(aq) + \operatorname{Fe}(s)$$

7. Write a balanced equation for the combustion of liquid methyl alcohol (CH<sub>3</sub>OH).

## **Oxidation-Reduction Worksheet**

For each reaction below, identify the atom oxidized, the atom reduced, the oxidizing agent, and the reducing agent.

1) 
$$Mg + 2HCl \rightarrow MgCl_2 + H_2$$

2) 
$$2\text{Fe} + 3\text{V}_2\text{O}_3 \rightarrow \text{Fe}_2\text{O}_3 + 6\text{VO}$$

3) 
$$2KMnO_4 + 5KNO_2 + 3H_2SO_4 \rightarrow 2MnSO_4 + 3H_2O + 5KNO_3 + K_2SO_4$$

4) 
$$K_2Cr_2O_7 + 3SnCl_2 + 14HCl \rightarrow 2CrCl_3 + 3SnCl_4 + 2KCl + 7H_2O$$

5) 
$$2KMnO_4 + 10NaCl + 8H_2SO_4 \rightarrow 5Cl_2 + K_2SO_4 + 2MnSO_4 + 8H_2O + 5Na_2SO_4$$

6) 
$$2K_2Cr_2O_7 + 2H_2O + 3S \rightarrow 3SO_2 + 4KOH + 2Cr_2O_3$$

7) 
$$8KClO_3 + C_{12}H_{22}O_{11} \rightarrow 8KCl + 11H_2O + 12CO_2$$

8) 
$$3H_2C_2O_4 + 2K_2MnO_4 \rightarrow 6CO_2 + 2K_2O + Mn_2O_3 + 3H_2O$$

9) 
$$2Mn(NO_3)_2 + 5NaBiO_3 + 16HNO_3 \rightarrow 2HMnO_4 + 5Bi(NO_3)_3 + 5NaNO_3 + 7H_2O_3$$

10) 
$$4H_2C_2O_4 + 2KMnO_4 \rightarrow 8CO_2 + K_2O + Mn_2O_3 + 4H_2O$$