

Part I: Write and balance the following reactions: include all states (s), (l), (g) and (aq).

Hints: Most metals are solids under normal conditions. Some elements are gasses under normal conditions. All ionic compounds are solids on their own. Any substance in a solution of water is considered to be aqueous.

Nitrogen and hydrogen react to form ammonia gas.

Liquid water decomposes into its elements.

Methane gas undergoes combustion to form _____ & _____ (you should know the products).

Sodium reacts with water to form hydrogen gas and a solution of sodium hydroxide.

Solutions of lead (II) nitrate and barium chloride react to form solid lead (II) chloride and a solution of barium nitrate.

Solutions of nitric acid and potassium hydroxide react to form water and aqueous potassium nitrate.

Solid sodium carbonate is added to a solution of hydrochloric acid. Aqueous sodium chloride, water and carbon dioxide are produced.

Part II Stoichiometry: Refer to the balanced equations in Part I.

1. How many grams of sodium are needed to react with 205g of water in the reaction that produced hydrogen gas and aqueous sodium hydroxide?

2. If 5.0g of nitrogen and 5.0g of hydrogen react, how many grams of ammonia will form?

A) Which reactant is the limiting reactant? Excess reactant?

B) How many grams of the excess reactant remain? (There are two ways to determine)