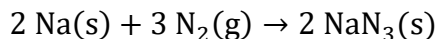


- Express the following concentrations as molarities.
 - 4.78 ppm Pb^{2+}
 - 3.22 ppb Zn^{2+}
 - 3.00% H_2O_2 by volume. Pure H_2O_2 has a density 1.45 g/mL
 - 10.74% NaOH by mass. The NaOH solution has a density of 1.40 g/mL.
- Balance the following equations
 - $\text{Mg} + \text{HNO}_3 \rightarrow \text{H}_2 + \text{Mg}(\text{NO}_3)_2$
 - $\text{CaC}_2 + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{C}_2\text{H}_2$
 - $\text{S} + \text{O}_2 \rightarrow \text{SO}_3$
 - $\text{UO}_2 + \text{HF} \rightarrow \text{UF}_4 + \text{H}_2\text{O}$
- Identify the following for the reactions below.
 - Molecular Equation (predict the product and balance the reaction including states)
 - Overall ionic equation (including states).
 - Net Ionic Equation (including states). If no reaction occurs, write NR.
 - Spectator Ions (if any).
 - $\text{HClO}_3 + \text{RbOH} \rightarrow$
 - $\text{Pb}(\text{NO}_3)_2 + \text{NH}_4\text{Cl} \rightarrow$
 - hydrobromic acid + sodium iodide \rightarrow
 - chromium(III)perchlorate + potassium flouride \rightarrow
- Identify the following as strong electrolytes, weak electrolytes, and nonelectrolytes
 - $\text{Be}(\text{OH})_3$
 - $\text{Fe}(\text{NO}_3)_3$
 - NH_3
 - KOH
 - C_3H_8
 - H_2SO_4
 - HF
 - Rb_3PO_3
 - CH_4O
- Identify whether the reaction is an oxidation reduction reaction. If so, identify what is oxidized, reduced, the oxidizing agent, and the reducing agent.
 - $4 \text{Fe}(\text{s}) + 3 \text{O}_2(\text{g}) \rightarrow 2 \text{Fe}_2\text{O}_3$
 - $\text{ZnO}(\text{s}) + \text{C}(\text{s}) \rightarrow \text{Zn}(\text{s}) + \text{CO}(\text{g})$
 - $\text{HI}(\text{aq}) + \text{NaOH}(\text{aq}) \rightarrow \text{NaI}(\text{aq}) + \text{H}_2\text{O}(\text{l})$
 - $\text{C}_3\text{H}_8(\text{g}) + 5 \text{O}_2(\text{g}) \rightarrow 3 \text{CO}_2(\text{g}) + 4 \text{H}_2\text{O}(\text{l})$

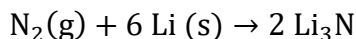
6. Predict whether each of the following sets of reactants will produce products.

- A. $\text{Cu(s)} + 2 \text{AgCl(s)} \rightarrow$
- B. $\text{Ni(s)} + \text{CaBr}_2\text{(aq)} \rightarrow$
- C. $\text{SnI}_2\text{(aq)} + \text{Zn(s)} \rightarrow$

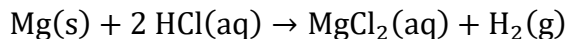
7. Answer the following about the reaction below.



- A. How many grams of solid sodium are required to fully react with 3.14×10^{23} molecules of nitrogen gas?
 - B. How many grams of sodium azide (NaN_3) will result from this reaction?
8. If 4.30×10^{22} molecules of nitrogen gas reacts with 5.00 g of solid lithium according to the reaction below, to yield 4.00 grams of lithium nitride, what is the percent yield of the reaction?



9. If 24.2 g of solid magnesium reacts with 550.0 mL of 3.00 M of hydrochloric acid, (A) how many grams of magnesium chloride are produced? (B) How many grams of the excess reactant are remaining?



10. Combustion of 135.0 g of a hydrocarbon produces 440.0 g of CO_2 and 135.0 g of H_2O . The molar mass of the hydrocarbon is 270 g/mol. What is the molecular formula of the compound?
11. How many milliliters of 0.100 M HNO_3 are needed to titrate 58.5 mL of 0.0100 M Sr(OH)_2 ?