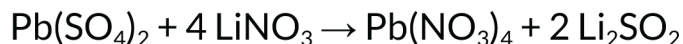


Stoichiometry Problems

1. Using the following equation:



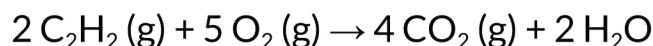
How much (in grams) lithium nitrate will be needed to make 250 grams of lithium sulfate, assuming you have enough lead (IV) sulfate to react?

2. Using the following equation:



How many moles and grams of KMnO_4 are needed for this reaction on 11.4 grams of KNO_2 ?

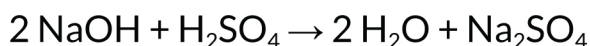
3. Acetylene gas (C_2H_2) undergoes combustion to form carbon dioxide and water when it is used for welding in an oxyacetylene torch. Balance the reaction and answer the following questions.



(a) How many grams of water can form if 113 g of acetylene is burned?

(b) How many moles of acetylene react if 1.10 moles of CO_2 are produced?

4. Using the following equation:

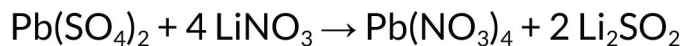


How many grams of sodium sulfate will be formed if you start with 200 grams of sodium hydroxide and excess sulfuric acid?

Stoichiometry Problems

Answers

1. Using the following equation:



How much (in grams) lithium nitrate will be needed to make 250 grams of lithium sulfate, assuming you have enough lead (IV) sulfate to react?

$$250 \text{ g Li}_2\text{SO}_4 \times (1 \text{ mol Li}_2\text{SO}_4 / 110 \text{ g Li}_2\text{SO}_4) \times (4 \text{ mol LiNO}_3 / 2 \text{ mol Li}_2\text{SO}_4) \\ \times (69 \text{ g LiNO}_3 / 1 \text{ mol LiNO}_3) = 313.6 \text{ g LiNO}_3$$

2. Using the following equation:

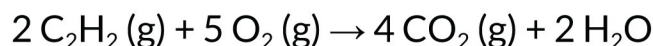


How many moles and grams of KMnO_4 are needed for this reaction on 11.4 grams of KNO_2 ?

$$11.4 \text{ g KNO}_2 \times (1 \text{ mol KNO}_2 / 85.1 \text{ g KNO}_2) \times (2 \text{ mol KMnO}_4 / 5 \text{ mol KNO}_2) \\ = 0.054 \text{ mol KMnO}_4$$

$$0.054 \text{ mol KMnO}_4 \times (158 \text{ g KMnO}_4 / 1 \text{ mol KMnO}_4) = 8.46 \text{ g KMnO}_4$$

3. Acetylene gas (C_2H_2) undergoes combustion to form carbon dioxide and water when it is used for welding in an oxyacetylene torch. Balance the reaction and answer the following questions.



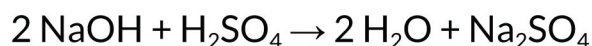
(a) How many grams of water can form if 113 g of acetylene is burned?

$$113 \text{ g C}_2\text{H}_2 \times (1 \text{ mol C}_2\text{H}_2 / 26 \text{ g C}_2\text{H}_2) \times (2 \text{ mol H}_2\text{O} / 2 \text{ mol C}_2\text{H}_2) \times (18 \text{ g H}_2\text{O} / 1 \text{ mol H}_2\text{O}) = \\ 78.2 \text{ g H}_2\text{O}$$

(b) How many moles of acetylene react if 1.10 moles of CO_2 are produced?

$$1.1 \text{ mol CO}_2 \times (2 \text{ mol C}_2\text{H}_2 / 4 \text{ mol CO}_2) = 0.55 \text{ mol C}_2\text{H}_2$$

4. Using the following equation:



How many grams of sodium sulfate will be formed if you start with 200 grams of sodium hydroxide and excess sulfuric acid?

$$200 \text{ g NaOH} \times (1 \text{ mol NaOH} / 40 \text{ g NaOH}) \times (1 \text{ mol Na}_2\text{SO}_4 / 2 \text{ mol NaOH}) \\ \times (142 \text{ g Na}_2\text{SO}_4 / 1 \text{ mol Na}_2\text{SO}_4) = 355 \text{ g Na}_2\text{SO}_4$$