5.4 Calculating Masses of Reactants and Products

- We need to be able to calculate the quantity of reactants needed to produce a certain quantity of a product.
- Gravimetric stoichiometry is the procedure for calculating the masses of reactants or products in a chemical reaction.

Calculating Mass of Reacts and Products

1. Balance the chemical reaction.
2. Write the measured mass of reactant or product written beneath the corresponding formula.
3. Convert the measured mass into an amount in moles.
4. Use the mole ration in the balanced equation to predict the amount in moles of desired substance.
5. Convert the predicted amount in moles into mass.

Sample Problem (p. 229 q.2)

Metallic iron can be obtained by heating iron ore, $Fe_2O_{3(s)}$, with hydrogen. The balanced equation for the reaction is given below:

$$Fe_2O_{3(s)} + 3H_{2(g)} \rightarrow 2Fe_{(s)} + 3H_2O_{(g)}$$

a) What mass of iron is produced from 500 kg of iron ore?
b) What mass of hydrogen gas is required to convert 1000kg of iron ore into iron?
c) If 220 kg of water is formed, what mass of iron ore was used up?

Homework

- Worksheet
- Practice Questions: 1-10
- Section Questions: 1-4