

Warm Up

How much water would need to be added to a 0.900M solution to create 190. mL of a 0.724M solution?

$$V_i = ?$$

$$C_i = 0.900M$$

$$V_f = 190. \text{ mL}$$

$$C_f = 0.724M$$

$$V_i C_i = V_f C_f$$

$$\frac{V_i (0.900M)}{(0.900M)} = \frac{(190. \text{ mL})(0.724M)}{(0.900M)}$$

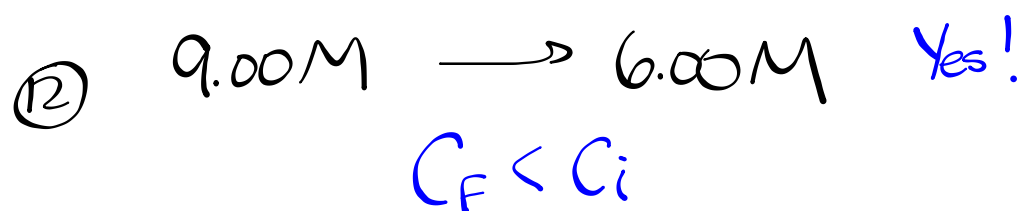
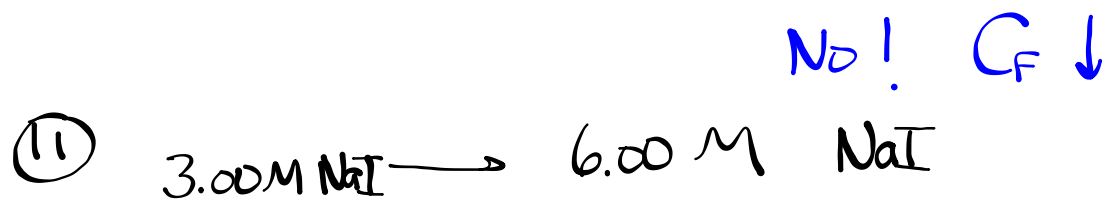
$$\underline{V_i = 153 \text{ mL}}$$

$$\left[\begin{array}{l} 153 \text{ mL} \\ 0.900M \end{array} \right]$$

$$\textcircled{37 \text{ mL}} \\ + \text{H}_2\text{O}$$

$$\left[\begin{array}{l} 190. \text{ mL} \\ 0.724M \end{array} \right]$$

Homework - Worksheet



Gravimetric Stoichiometry

Gravimetric - refers to mass measurement

Stoichiometric - refers to the procedure used to calculate quantities of chemicals.

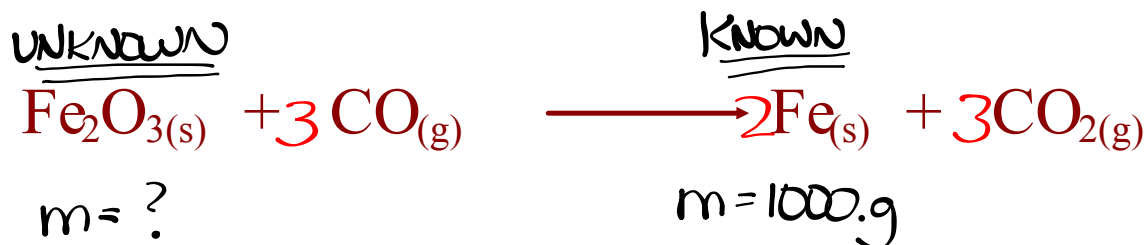
GRAVIMETRIC STOICHIOMETRY - the procedure for calculating the masses of reactants and products in a chemical reaction.

ASSUMPTIONS IN STOICHIOMETRY

- the reaction is spontaneous.
- the reaction is fast
- the reaction is quantitative.
- the reaction is stoichiometric.

(there is a whole number ratio between MOLES of reactant and MOLES of product.)

What mass of iron (III) oxide is required to produce 1000. g of iron according to the following reaction?



Step 1: # moles known

$$1000. \text{g Fe} \times \frac{1 \text{ mol Fe}}{55.85 \text{ g Fe}} = 17.905 \text{ mol Fe}$$

Step 2: moles unknown

$$17.905 \text{ mol Fe} \times \frac{1 \text{ mol Fe}_2\text{O}_3}{2 \text{ mol Fe}} = 8.953 \text{ mol Fe}_2\text{O}_3$$

Step 3: mass unknown

$$8.953 \text{ mol Fe}_2\text{O}_3 \times \frac{159.70 \text{ g Fe}_2\text{O}_3}{1 \text{ mol Fe}_2\text{O}_3} = 1430. \text{g Fe}_2\text{O}_3$$

Try This



What mass of aluminum oxide will be produced if 17.0 g of oxygen reacts with excess aluminum?

