

College Prep Chemistry of the Earth System

Assignment 7D

40 Points

Double Mass Stoichiometry

Using the balanced chemical reaction, determine the molar ratio. Use the molar ratio to convert between A and B.

1. $3\text{CaCl}_2 + \text{Al}_2\text{S}_3 \rightarrow 3\text{CaS} + 2\text{AlCl}_3$
Convert 194.5g CaCl_2 to mass AlCl_3
 $MM_{\text{CaCl}_2} = 110.98\text{g/mol}$
 $MM_{\text{AlCl}_3} = 133.33\text{g/mol}$

Steps to Solve

- A. Mass $\text{CaCl}_2 \rightarrow \text{Mol CaCl}_2$
B. Mol $\text{CaCl}_2 \rightarrow \text{Mol AlCl}_3$
C. Mol $\text{AlCl}_3 \rightarrow \text{Mass AlCl}_3$

2. $4\text{V} + 3\text{PbS}_2 \rightarrow 3\text{Pb} + 2\text{V}_2\text{S}_3$
Convert 200.3g V to mass V_2S_3
 $MM_{\text{V}} = 50.94\text{g/mol}$
 $MM_{\text{V}_2\text{S}_3} = 198.09\text{g/mol}$

Steps to Solve

- A. Mass V $\rightarrow$ Mol V
B. Mol V $\rightarrow$ Mol V_2S_3
C. Mol $\text{V}_2\text{S}_3 \rightarrow$ Mass V_2S_3

3. $2\text{Cr}(\text{FO}_3)_3 + 3\text{Na}_2\text{CO}_3 \rightarrow$
 $\text{Cr}_2(\text{CO}_3)_3 + 6\text{NaFO}_3$
Convert 93.5g Na_2CO_3 to mass NaFO_3
 $MM_{\text{Na}_2\text{CO}_3} = 105.99\text{g/mol}$
 $MM_{\text{NaFO}_3} = 89.99\text{g/mol}$

Steps to Solve

- A. Mass $\text{Na}_2\text{CO}_3 \rightarrow \text{Mol Na}_2\text{CO}_3$
B. Mol $\text{Na}_2\text{CO}_3 \rightarrow \text{Mol NaFO}_3$
C. Mol $\text{NaFO}_3 \rightarrow \text{Mass NaFO}_3$

4. $\text{W}(\text{PO}_3)_2 + 3\text{Mn}(\text{OH})_2 \rightarrow$
 $\text{W}(\text{OH})_6 + \text{Mn}_3(\text{PO}_4)_2$
Convert 245.0g $\text{Mn}(\text{OH})_2$
to mass $\text{W}(\text{OH})_6$
 $MM_{\text{Mn}(\text{OH})_2} = 88.96\text{g/mol}$
 $MM_{\text{W}(\text{OH})_6} = 285.90\text{g/mol}$

Steps to Solve

- A. Mass $\text{Mn}(\text{OH})_2 \rightarrow \text{Mol Mn}(\text{OH})_2$
B. Mol $\text{Mn}(\text{OH})_2 \rightarrow \text{Mol W}(\text{OH})_6$
C. Mol $\text{W}(\text{OH})_6 \rightarrow \text{Mass W}(\text{OH})_6$