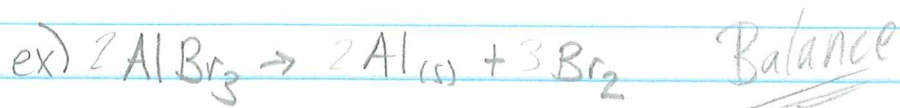


## 11.2 Notes Mass to Mass

\* Starting w/ a known mass of a substance

- Solving for mass of another substance



given: mass of  $\text{AlBr}_3 = 582.9 \text{ g} \rightarrow ? \text{ g Br}_2$

- Find molar mass of known ( $\text{AlBr}_3$ ) =  $\frac{\text{Al} - 1 \times 27.0}{\text{Br} - 3 \times 79.9} = 266.7 \text{ g/mol}$

\* Multiply known mass by inverse of molar mass to convert to moles  $\text{AlBr}_3$

$$582.9 \text{ g AlBr}_3 \times \frac{1 \text{ mol}}{266.7 \text{ g}} = 2.19 \text{ mol AlBr}_3$$

\* use mole ratio to convert between moles of known & what you are solving for ( $\text{AlBr}_3 \rightarrow \text{Br}_2$ )

$$2.19 \text{ mol AlBr}_3 \times \frac{3 \text{ mol Br}_2}{2 \text{ mol AlBr}_3} = 3.29 \text{ mol Br}_2$$

\* Find molar mass of  $\text{Br}_2$  ( $2 \times 79.9$ ) =  $159.8 \text{ g/mol}$

\* Multiply moles  $\text{Br}_2$  by molar mass

$$3.29 \text{ mol Br}_2 \times \frac{159.8 \text{ g}}{1 \text{ mol Br}_2} = \boxed{525.7 \text{ g Br}_2}$$

\* There are more steps to Mass to Mass than others we have learned!



given: 59.8 g Na  $\rightarrow$  ? g NaOH

\* Calc. molar mass of Na (22.9 g/mol) - Multiply by inverse

$59.8 \text{ g Na} \times \frac{1 \text{ mol}}{22.9 \text{ g}} = 2.61 \text{ mol Na}$

\* Multiply by mole ratio to convert

Ratio =  $\frac{2 \text{ mol NaOH}}{2 \text{ mol Na}} \quad 2.61 \text{ mol Na} \times \frac{2 \text{ mol NaOH}}{2 \text{ mol Na}} = 2.61 \text{ mol NaOH}$

\* Calc. the molar mass of NaOH  $\left\{ \begin{array}{l} \text{Na} - 1 \times 22.9 \\ \text{O} - 1 \times 16.0 \\ \text{H} - 1 \times 1.0 \end{array} \right.$   
39.9 g/mol

\* Multiply by molar mass of NaOH to determine mass NaOH

$2.61 \text{ mol NaOH} \times \frac{39.9 \text{ g}}{1 \text{ mol NaOH}} = \boxed{104.1 \text{ g NaOH}}$