

Download File PDF Chemistry Stoichiometry 2 Percent Yield Answers

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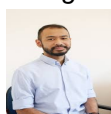
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Stoichiometry Worksheet 2: Percent Yield

For each of the problems below:
a. Write the balanced chemical equation
b. Identify the given (with units) and what you want to find (with units)
c. Show set up with units. Check sig figs, give final answer with units and label.

1. Using the Hoffman apparatus for electrolysis, a chemist decomposes 36 g of water into its gaseous elements. How many grams of hydrogen gas should she get (theoretical yield)?

Equation: $2 \text{H}_2\text{O} \rightarrow 2 \text{H}_2 + 1 \text{O}_2$

Before	2 mol	0 mol	0 mol
Change	-2 mol	+2 mol	0 mol
After	0 mol	2 mol	0 mol

$$36 \text{ g H}_2\text{O} \times \frac{1 \text{ mol H}_2\text{O}}{18.0 \text{ g H}_2\text{O}} = 2.0 \text{ mol H}_2\text{O} \times \frac{2 \text{ mol H}_2}{2 \text{ mol H}_2\text{O}} = 2 \text{ mol H}_2 \times \frac{2.0 \text{ g H}_2}{1 \text{ mol H}_2} = 4.0 \text{ g H}_2$$

2. Recall that liquid sodium reacts with chlorine gas to produce sodium chloride. You want to produce 581 g of sodium chloride. How many grams of sodium are needed?

Equation: $2 \text{Na} + 1 \text{Cl}_2 \rightarrow 2 \text{NaCl}$

Before	9.91 mol	xx mol	0 mol
Change	-9.91 mol	-4.95 mol	+9.91 mol
After	0 mol	9.91 mol	0 mol

$$581 \text{ g NaCl} \times \frac{1 \text{ mol NaCl}}{58.5 \text{ g NaCl}} = 9.93 \text{ mol NaCl} \times \frac{2 \text{ mol Na}}{2 \text{ mol NaCl}} = 9.93 \text{ mol Na} \times \frac{23.0 \text{ g Na}}{1 \text{ mol Na}} = 228 \text{ g Na}$$

3. You eat 180.0 g of glucose (90 M&M's). If glucose, $\text{C}_6\text{H}_{12}\text{O}_6$, reacts with oxygen gas to produce carbon dioxide and water, how many grams of oxygen will you have to breathe in to burn the glucose?

Equation: $1 \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2 \rightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O}$

Before	1.0 mol	xx mol	0 mol	0 mol
Change	-1.0 mol	-6.0 mol	+6.0 mol	+6.0 mol
After	0 mol	xx mol	6.0 mol	6.0 mol

$$180.0 \text{ g C}_6\text{H}_{12}\text{O}_6 \times \frac{1 \text{ mol C}_6\text{H}_{12}\text{O}_6}{180 \text{ g C}_6\text{H}_{12}\text{O}_6} = 1.00 \text{ mol C}_6\text{H}_{12}\text{O}_6 \times \frac{6 \text{ mol O}_2}{1 \text{ mol C}_6\text{H}_{12}\text{O}_6} = 6.00 \text{ mol O}_2$$
$$6.0 \text{ mol O}_2 \times \frac{32.0 \text{ g O}_2}{1 \text{ mol O}_2} = 192.0 \text{ g O}_2$$

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