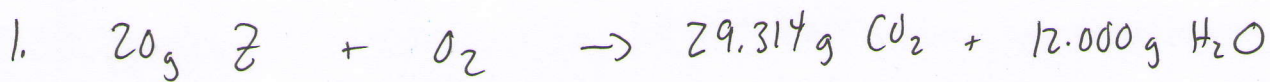




Test 4 - Additional Review Problems - Answers



$$29.314\text{ g CO}_2 \times \frac{1\text{ mol CO}_2}{44.011\text{ g CO}_2} \times \frac{1\text{ mol C}}{1\text{ mol CO}_2} = \boxed{0.666\text{ mol C}} \times \frac{12.011\text{ g C}}{1\text{ mol C}} = \boxed{8.000\text{ g C}}$$

in 7

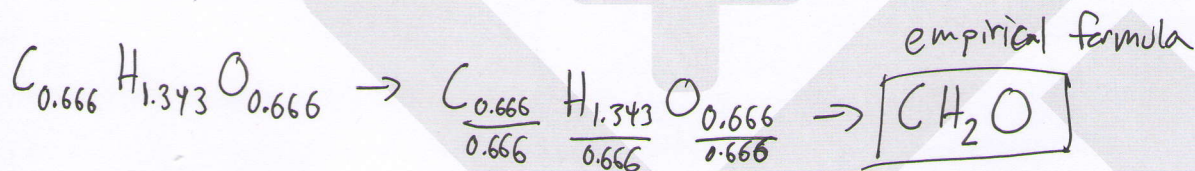
$$12.000\text{ g H}_2\text{O} \times \frac{1\text{ mol H}_2\text{O}}{18.0158\text{ g H}_2\text{O}} \times \frac{2\text{ mol H}}{1\text{ mol H}_2\text{O}} = \boxed{1.332\text{ mol H}} \times \frac{1.0079\text{ g H}}{1\text{ mol H}} = \boxed{1.343\text{ g H}}$$

in 7

$$20\text{ g} - (8.000\text{ g} + 1.343\text{ g}) = \boxed{10.657\text{ g O}}$$

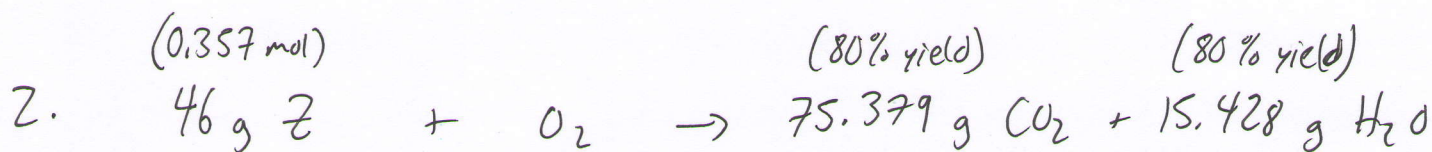
in 7

$$\times \frac{1\text{ mol O}}{16\text{ g O}} = \boxed{0.666\text{ mol O}}$$



$$\frac{\text{molecular molar mass}}{\text{empirical molar mass}} = \frac{60.056\text{ g/mol}}{30.027\text{ g/mol}} \approx 2 \Rightarrow \boxed{\text{C}_2\text{H}_4\text{O}_2}$$

molecular formula



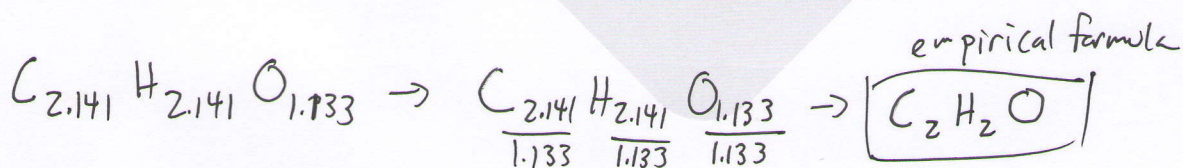
$$\text{Theoretical yield } \text{CO}_2 = \frac{75.379 \text{ g}}{0.8} = 94.224 \text{ g } \text{CO}_2$$

$$94.224 \text{ g } \text{CO}_2 \times \frac{1 \text{ mol } \text{CO}_2}{44.011 \text{ g } \text{CO}_2} \times \frac{1 \text{ mol } \text{C}}{1 \text{ mol } \text{CO}_2} = \boxed{2.141 \text{ mol } \text{C}} \times \frac{12.011 \text{ g } \text{C}}{1 \text{ mol } \text{C}} = \boxed{25.715 \text{ g } \text{C}} \text{ in } Z$$

$$\text{Theoretical yield } \text{H}_2\text{O} = \frac{15.428 \text{ g}}{0.8} = 19.285 \text{ g } \text{H}_2\text{O}$$

$$19.285 \text{ g } \text{H}_2\text{O} \times \frac{1 \text{ mol } \text{H}_2\text{O}}{18.0158 \text{ g } \text{H}_2\text{O}} \times \frac{2 \text{ mol } \text{H}}{1 \text{ mol } \text{H}_2\text{O}} = \boxed{2.141 \text{ mol } \text{H}} \times \frac{1.0079 \text{ g } \text{H}}{1 \text{ mol } \text{H}} = \boxed{2.158 \text{ g } \text{H}} \text{ in } Z$$

$$46 \text{ g} - (25.715 \text{ g} + 2.158 \text{ g}) = \boxed{18.127 \text{ g } \text{O}} \text{ in } Z \times \frac{1 \text{ mol } \text{O}}{16 \text{ g } \text{O}} = \boxed{1.133 \text{ mol } \text{O}}$$



$$\frac{\text{molecular molar mass}}{\text{empirical molar mass}} = \frac{(46 \text{ g} / 0.357 \text{ mol})}{42.0378 \text{ g/mol}} \approx 3 \Rightarrow \boxed{\text{C}_6 \text{H}_6 \text{O}_3} \text{ molecular formula}$$